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Media interventions in public space

A place-based approach for the assessment of human experience in digitally augmented urban environments

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“By far the greatest and most admirable form of wisdom

is that needed to plan and beautify cities and human communities”

Socrates 469-399 BC

Abstract

Considering the amount of time people spend occupying public spaces during their lives in the city, the quality of the urban environment is crucial as it is found to have significant effects on their behaviour, performance, social development as well as their wellbeing (Adams, 2014; Thwaites et al., 2017; Anderson et al., 2017). The last decade, urban public spaces have changed considerably through the gradual integration of digital technology into them. Furthermore, urban architecture and public art have manifested possibilities they never had before. The result is that contemporary public spaces are now highly digitized. This combination of physical and digital elements in space, also known as media architecture and urban media art, is frequently thought as a tool to stimulate and amplify casual urban experiences. While most research studies on urban situated digital technologies focus either on their functional- technical dimension or on their social effects, little is known on the overall impact of these media stimuli on the versatile aspects of human experience. In this context, the study by adopting a place-based approach, aims to interpret how the multiple interrelated elements of human experience can be affected by the implementation of digital installations and, ultimately, explore the potential of digital augmented public spaces to act as mediators for more responsive and citizen-centred urban environments. The theoretical framework of the study is based on fundamental Place theories which have been assessed and synthesized in order to develop a new comprehensive basis for the concept of place experience.

The research project employed a pragmatic methodology to human- environment interaction which links the academic fields of urban and landscape design, phenomenology, psychology, environmental psychology and neuroscience using an embedded case study approach. It triangulated several techniques which include field observations, on-site discussions, semi-structured and in-depth phenomenological interviews, a field-based psychophysiological experiment as well as digital ethnography. The research found critical transformations in place experience during the digital augmentation of the four examined public spaces which involved changes in space's activity, vibrancy, social interaction and level of contact with strangers, inclusion, human proxemics as well as emergence of playful behaviour, phenomena of place personalization and creative bodily expression. The main contribution of the study is threefold; a. it provides theoretical input through the examination of the affordances of urban media interventions in place experience and of their value as

placemaking tools; b. it delivers methodological input through the development of a multidisciplinary pragmatic framework for the assessment and evaluation of complex phenomena associated with human experience in public space; c. it offers empirical input through the suggestion of a number of design and planning considerations for the development of active, pleasant and human-friendly urban media environments.

Key words: Media architecture; urban media art; place; place experience; placemaking; urban public space; interactive and collaborative public media; digital technology; tactical urbanism; media events

Publications and Lectures

Heath, T. and Pavlaki, E. (2020) 'Enhancing the identity of cities through creative media installations', in Pomeroy, J. (ed) Cities of Opportunities: Connecting Culture and Innovation, London, Routledge, pp.52-69

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Glossary

The following table defines the concept of various terms frequently used throughout the thesis (and generally in the field of this study) and it is considered as highly significant for a thorough understanding of it. This glossary is not exhaustive, but it seeks to provide the reader with the most relevant information and definitions.

Term	Definition	Source
Hybrid space	Hybrid space is the form of environment that is developed when new types of digital devices, services and objects are integrated into the built environment enhancing or even changing the way in which a space is perceived and experienced.	*Morrison, 2018*
Urban media environment	Urban media environments refer to urban spaces that consist of media artefacts such as urban screens, media facades, media architectures, but also personal mobile devices that are either integrated in a local media architecture or that are simply used for personal mobile communication.	*Tscherteu & Tomitsch, 2011: 3*
Digitally augmented public space	Public space that accommodates high number of digital features.	*Author*
Media architecture	The utilization of specific categories of media - namely those based on information technologies - in the design of architectural elements that can convey their own dynamic information or prompt transient sensorial experiences	*Hespanhol, 2017: 54*
(Urban) media art	Media art comprises several forms of digital-aesthetic, artistic practices in which artists "create and make use of innovations in software and technology to craft artworks for visible and invisible implementation." Urban media art represents the same concept but applied in urban environments.	*Toft, 2016 in Pop et al., 2016: 50*
Urban media (or digital) interventions	All the physical installations that use digital technology to "intervene in public spaces, changing their nature and use ephemerally".	*Fischer and Hornecker, 2012: 2*
Digital (or media) installation	Physical installation augmented by digital or light technology in the form of 'static', 'dynamic-passive' or 'dynamic-interactive' features. Essentially, this category includes or types of media artefacts regardless if- or to what extent, they can change or be modified.	Cornock and Edmonds, 1979 in Punnen, 2014

Interactive installation	Installations that 'can be transformed or effected by the actions of the user or the subject, or in other words, the installation "performs" based on the manipulations of the actor.	*Punnen, 2014: 52*

CHAPTER 1

Introduction

This research examines the impact of the implementation of urban media technologies on public space experience. Human response towards the surrounding context is directly related to the quality and organization of this context as well as to the environmental stimuli it facilitates. Digital installations in this research project act as tools for stimulation and meaningful human spatial engagement and, thus, the study adopts a place-based approach to assess the reciprocal effects deriving from this threefold relationship (people-space-digital installation).

This chapter is divided into five main parts. The first part of the chapter shows the research background and issues that motivated the study. The second part illustrates the overall research approach by explaining the versatility of place concept and by briefly introducing the fundamental multidisciplinary theoretical model behind that; human ecology. The third part presents the main research aims, objectives and questions, while the fourth part details the scope of the study. Finally, the fifth and last part of this chapter provides the thesis structure by illustrating the main content of the following chapters.

1.1 Background and Rationale for the Research

The predominance of cities and the massive phenomenon of urbanization in contemporary world are undeniable. As a result, the quality of experience cities provide to their citizens is directly associated with the quality of life and wellbeing of them. At the same time, digital technology is entering in more and more fields of people's everyday life and space. So, what could possibly be the implications of the combination of these two rapidly developing phenomena? This section will establish the background for the research by examining the versatile role of cities and urban spaces in people's life and experience, exploring the emergence of the concept of new digital publics and assessing the role of digital element as a new feature of public space. Subsequently, the main rational for the study will be discussed.

1.1.1 City, Place and Experience

> *"People now migrate to urban areas for a whole host of reasons; for employment, but also for the vibrancy and culture of the city, experience and connection. With this comes the need for a new aesthetic function and identity in cities.* ***In the future, the challenge for urban planning will not just be in squeezing the most out of the space, but in squeezing the most out of the experience of urban life****."*

Arup, 2014: 31

According to United Nations (2018) 55% of the world's population lives in urban areas, a figure that is projected to increase to 66% by 2050. Cities are complex, dynamic and powerful systems constituting traditional centres for worlds economy, key nodes for services and networks as well as basis for socio-political development. Furthermore, they comprise settings of different environmental models and locus of technological advancement. Profoundly, their multidimensional character affects several facets of human existence and performance through the integration of various interacting aspects.

In this study, cities are considered as significant forms of *places*. Although the concept of place will be thoroughly examined in the next chapter, essentially the idea of place refers to

> *"a specific site that is shaped by, and shape, the lives of human beings. Sites of human identity, security, and community."*

Paulsen et al., 2012: 3

As places, cities are not solely comprised by the physical, economic, and political settings they represent. Yet, they encompass all those special and powerful sites that people feel attached to, are unique and meaningful to them and are actively experienced through their everyday lives. Therefore, places are inherently related to human life and experience.

But what is essentially 'experience' in an urban setting? If place is "a space with experience added in" (Sewall, 1999: 167), then a simple understanding of experience is the quality that differentiates an undefined location from a meaningful environment. In this context, Paulsen et al. (2012) note that the everyday uses, experiences and meanings are what make cities distinct from each other. However, the last two centuries has seen several social, political and environmental complexities that inevitably affected the quality of cities. Unprecedented levels of urbanization, phenomena of urban sprawl, predominance of the automobile, social inequality and environmental pollution are just some factors that have resulted in the redefinition of contemporary cities and also caused public space decline (Carmona et al., 2019). Ultimately, it has been advocated that due to these reasons people are much less connected to their urban settings than they used to be in the past (Gustafson, 2009). This, so called, 'extinction of experience' (Miller, 2005:430) has serious effects on their physical and mental health, social relationships and their overall quality of life (Romice et al., 2017).

A major purpose of this study is to assess urban spaces as lived places looking at the ways in which these spaces are infused with meanings and perceptions through everyday lived experiences. Having as a key focus the contemporary digitally augmented public space, it will explore various spatial, social and perceptual dimensions that contribute to human experience and behavior in these urban settings. The concept of digitally augmented space will be introduced and further explored in the following sections.

1.1.2 The Emergence of New digital Publics

> *"The changes I mean are those little multimedia sparks which have started to become part of the urban landscape surrounding us: digital screens set in frequently visited places (such as stations, squares and airports), interactive shopping windows, public projections, and multimedia advertising billboards.* ***Those elements are more and more discussed and arouse curiosity as much as the latest discoveries in the ever-present demotic****."*

Marco Mancuso, 2019, para. 2

The concept of public space as a key element of public life in the city emerged as late as the last century (Habermas, 1989). However, the idea that public life can provide understanding on how a society deals with the notion of collective thought or action occurs since ancient Greek time. In that context, ancient Greek agora is one of the first physical representations of public sphere, being the centre of civic activity and a core space for citizens to gather and discuss publicly (Evangelidis, 2014).

Since the early 1990's theorists started to raise new concerns on public space which related to the use of media and the Internet, claiming that this condition could gradually lead to the privatization of public space (Ling, 2005). Their main argument for was that due to the use of digital technology, mobile phones and social networks social life and especially face-to-face interaction will no longer need to occur in public space, since people could use various other modes of communication besides their involvement into public life (Lofland, 1998).

Opposite arguments initially involved discussions on "networked publics" which suggested that public life can also occur away the public sphere and public space in a diversity of ways and interaction platforms both spatial and technological (Boyd, 2012). In his research study which focused on the effects of digital technology, and particularly urban screens, on public space, *The Politics of public space in the media city,* McQuire (2015: 4) concludes that "*new forms of public interaction which involve sharing and negotiation between individual and collective agency can play a vital role in challenging the dominance of public space by spectacular 'brandscapes' or its pacification by surveillance*". According to Beiguelman (2006) new forms of media technology deriving from contemporary culture can impact on new productions and form of public space, while Wallace (2003) believes that the deployment of such technologies in the urban environment can act as a 'delivery mechanism' to inhabit or transform physical space. Stuppek (2006) suggests that artists and designers are now experimenting with opportunities provided by digital technology building interconnections between physical and digital world and between collective experiences in virtual and physical space. **Furthermore, Lozano-Hemmer (2002) highlights the role of the users in the physical infrastructure and virtual information integration by pointing out that in that process users have the power to bring changes in urban space. In a similar sense Willis (2016) advocates that if new models of participatory media be located in public space then digital technology can contribute to the performance of publics in public**

space through the encouragement of collective action and spontaneous social encounters. This statement aligns with the goals of this PhD study.

Willis (2016) in her study Space and Place in a Networked Wolrd explores this contemporary type of publics mediated by digital technology, digital publics, identifying the concept of Hybrid Space as an integral feature of this phenomenon.

Hybrid Space

Hybrid space is the form of environment that is developed when new types of digital devices, services and objects are integrated into the built environment enhancing or even changing the way in which a space is perceived and experienced (Morrison, 2018). This is achieved through the embedment of information and new interactive features into everyday urban spaces, artefacts and surfaces, already familiar to users, that stimulates the conception of novel creative uses. In this context, McQuire (2006: 2) notes that "*a mediatised production of urban space has become a constitutive frame for a new mode of social experience*", using also the term *relational space* to refer to the ephemeral qualities of the novel digitally enhanced urban projects. One of the first and most representative examples of this form of hybrid space is the work of the digital artist Lozano-Hemmer *Body Movies* (fig. 1.1). The media artwork, essentially, engages the users by presenting their figures on a building façade of a central urban square in Rotterdam. According to the artist, the integration of digital features into physical infrastructure suggests that the users identify themselves in a unique place in the urban context, realizing that they have the powerful opportunity to transform the space (Lozano-Hemmer, 2002).

> *"As soon as people walked on the square, however, their shadows were projected on the building and the portraits were revealed within them. Passers-by could move around and match the scale of a portrait by going toward or away from the building, making their silhouettes between 2 and 22 meters high. A camera-based tracking system monitored the location of the shadows in real time and, when the shadows matched all the portraits in a given scene, the control computer issued an automatic command to change the scene to the next set of portraits. This way the people on the square were invited to embody different representational narratives. Over 50 people could take part at any given time, controlling 1,200 square meters of projections and creating a collective experience that nonetheless allowed discrete individual participation." (ibid, p.1)*

Fig.1.1 *Body Movies* by Rafael Lozano-Hemmer (https://courses.ideate.cmu.edu/)

Ultimately, as Al-Azhari et al. (2014) point out, digital publics can be considered as the result of the digital revolution which calls for the reimagination of cities and public spaces and reconnection to them. In the establishment of this new relationship media play a critical role by developing new forms of interaction between users and public spaces and, consequently, transforming urban space into an active and interactive place. **In the context of this study, the term 'digitally augmented/ enhanced urban environments' and 'urban media environments' (Tscherteu & Tomitsch, 2011) will be used to denote the contemporary urban context consisting of physical architecture blended with media infrastructure in variable ratios.**

1.1.3 Blending the Old and the New: Digital element in public space

New digital publics and hybrid space, essentially, reflect the phenomenon of the migration of digital technology to urban space which leads to a blurring of boundaries between Architecture, Urban Design and Human Computer Interaction (HCI). This increasing number of digital media deployed in city's public spaces affect multiple qualities of the urban context creating new opportunities for interaction, communication, participation and various forms of experiences. However, the overarching purpose of these new urban expressions is not novel as it fundamentally relies on a typical role of architecture; creation of new experiences and communication.

a) Architecture as a mode of experience and communication and the emergence of situated media in the city

The new digital aesthetics implemented in public spaces in the form of facades, screens or installations align with historical models that involve architecture as a mode of communication, a form of iconography (Ventury and Brown, 2004). For example, sculptures enclosed ancient Greek and Roman temples to narrate stories of morality and braveness (Spivey, 2013); Slight augmentations in Gothic cathedrals represented God's glory, window mosaics and façade sculptures used to convey stories and meanings (Brooke, 2016); and the characteristic ornamentation in Baroque trend was used to demonstrate power and wealth (Picon, 2014). And although the modernist movement ordered simplicity, the original significance of the ornament transformed into a symbolic configuration of it through structure, materiality and space's experience (Venturi, 1977). According to Venturi architecture should go back to its initial interpretation as iconography and more specifically as information surface (Manovich, 2006). In this regard, information surface could be also considered as an information layer as it promotes communication in a spatial framework (Stojsij, 2017).

Since 1960's, Ventury constantly suggested that architecture should be influenced by the local context as well as the commercial culture (labels, billboards, signs, malls). His books Complexity and Contradiction in Architecture and Learning from Las Vegas are considered as the first documents that establish the post- modern aesthetics. According to him, architects should refuse the modernist requirement for simplistic ornament- free schemes, and instead approach contrast, complexity and diversity in the built environment (Fischer and Hornecker, 2012).

French philosopher Paul Virilio has stressed the importance of digital media and screen effect, like cinema and television, in the configuration of the urban experience. He also considers architecture as a means of communication with examples throughout the history including traditional structures such as medieval cathedrals. Contrary to Ventury, he explores the transformation of the urban experience depending on the impact of personal perception created by the media culture that has become a prevalent feature of contemporary society. He believes that the experience of the city, just like in a movie, is formed through our consciousness. Particularly, our initial perception of time and space is influenced by digital media and the information layer that they generate in public and private space. For Virilio architecture is no longer for living but for providing and assessing information (Stojsij, 2017).

Regarding outdoor screens, although they seem to have appeared in the urban setting relatively recently, they have roots back to the 19th century. Media archaeologist Erkki Huhtamo (2004) points out that back in that time lanterns were applied onto stable pictures and advertisements located on buildings, converting them to large projections screens. Later, during the 1930s scrolling marquee displays arose to reveal convertible text messages on theaters and street signs. One of the first efforts to implement shifting images into the frontage of a building was illustrated in the early plans of the winning application for Centre George Pompidou in 1971 by Piano and Rogers. The concept was to project changing pictures onto giant screens located on the metallic frames of the façade. Yet, due to cuts in the financial plan and the lack of a proper technology, the idea had to be discarded. However, the concept of big screens in public space was soon to be appreciated in a totally different way (fig. 1.2). Before the existence of outdoor screens in the real world, they were presented in the science fiction film Blade Runner in 1982, as enormous hovering billboards featuring advertisements (Ebsen, 2010).

	Television Computer	Cinema Urban screens	Media facades	Media installation art
Metaphor	window	wall	skin	sculpture
Presence	pervasive	located	situated	temporary
Perception	distracted	immersed	reflective	ambiguous
Reception	private	collective	public	relational
Field of study	media studies	sociology	architecture	art

Fig.1.2 Physical Evolution Of Media. Adapted from Ebsen, 2013

The project Blinkenlights in 2001 in Berlin is thought to be the first digital façade that was clearly configured (Haeusler, 2009), although designed for a short time period only. In this project, normal lamps were placed behind the windows of the eight last floors of a high- rise building forming an 8 by 18 “pixel” display (McQuire, 2008).

During the last fifteen years, more and more novel experimental projects that combine electronic media and architecture are being developed. These projects involve building facades transformed into large screens, digital art installations, video projections and interactive devices incorporated into building features. The

development of digital and lighting technology, mobile computing, as well as the prevalence of wireless internet applications has greatly contributed to the advancement of those artefacts. However, their quality of use and aesthetics is mainly based on the intention of the designer; for example, the aforementioned project Body Movies by Lozano- Hemmer, although being almost twenty years old, it still remains one of the most influential and poetic manifestations of what integrating media into urban space for the active interaction of the public is.

b) The digital materiality of contemporary architecture and urban design: introducing new urban expressions

The phenomenon of the new digital publics along with the spatial expression of digital technology in the city and its public space led to the emergence of some novel and quite significant fields in the area architecture and urban design by implementing principles of Information Technology, Human-Computer Interaction and Computer Science into their traditional normative frameworks. Although several terms have been used to describe these relatively recent spatial gestures, the most prominent ones are the ideas of Media Architecture, Urban media art and digital placemaking.

Media Architecture

According to Hespanhol (2017: 54): “Media architecture refers to the utilization of specific categories of media - namely those based on information technologies - in the design of architectural elements that can convey their own dynamic information or prompt transient sensorial experiences”. Practices of media architecture involve interactive building surfaces, media facades and urban screens. This form of architecture frequently serves commercial and aesthetic purposes, however lately, its social and cultural potential has also been acknowledged (Heath and Pavlaki, 2020). Particularly, the social tole of media architecture has been recognized due to its potential to facilitate new activities and patterns of human interaction in public space (Brignull and Rogers, 2003) and generally in the city (Brynskov et al., 2009).

Media Art

Closely related to the notion and process of media architecture, media art comprises several forms of digital-aesthetic, artistic practices in which artists “create and make use of innovations in software and technology to craft artworks for visible and invisible implementation.” (Toft, 2016 in Pop et al., 2016: 50) Urban media art represents the same concept but applied in urban environments. Frequently regarded as a dimension of media architecture, the innovative technologies it deploys may include

digital art, computer animation, virtual art, interactive features, gaming, computer robotics, or 3D printing.

The experimentation with digital forms of public art goes back to the expansion of cinema projections in public space in the 1960s. Since then, urban media art has developed as a movement which embodies art, public art and media architecture in the form of a novel digital culture that is frequently finding a place in the public realm of cities (Toft, 2017 in Hespanhol et al., 2017). Media art and architecture can encourage human interaction and experience while at the same time creating meanings and identities “in a digital milieu” of public space (Colangelo, 2017 in Hespanhol et al., 2017:89). Media art, architecture and digital placemaking can therefore, through careful planning and design, contribute to the revitalization and recuperation of public space while also promoting hybrid urban settings of participation, collaboration, sociability, dialogue, and play (ibid) (fig. 1.3).

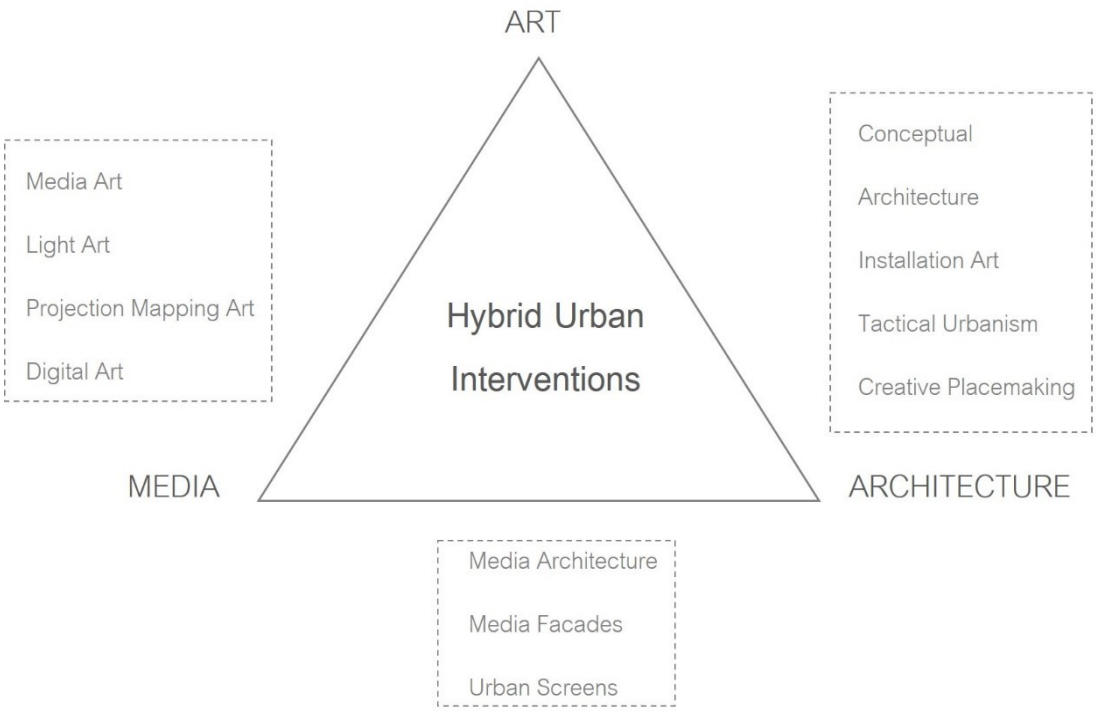

Fig. 1.3 Physical manifestations of the intersections of Media, Art and Architecture

Digital Placemaking

This term has been quite recently introduced and has not been thoroughly assessed in academic literature. Generally, as a concept refers to:

> *"the process of using digital media for shaping urban experiences that are citizen-centric, both in their conception and implementation"*

Tomitsch in Chousein, 2016, para.3

According to Morrison (2018) the aim of digital placemaking is to improve quality of public space, attract various user groups to them and enhance their connection to the city and, in turn, to each other.

1.1.4 Rationale

Considering the transformations that have occurred in the urban environments and public space in the last decades, as well as the move towards new technological developments being integrated into traditional urban and architectural design, contemporary practices and types of spaces require careful evaluation. It is essential that a better understanding of these novel forms of hybrid space is obtained and the potential impact of situated digital technologies on the users is explored, in order to identify what has worked well and understand any issues that may still need to be addressed in the future. After a long period in which digitally mediated artefacts were considered as the subject of computer scientists and HCI experts, their rapid emergence in the contemporary urban landscape led to an increased interest in the ways in which digital media affect the actual physical context of the cities.

Particularly in terms of public space, evaluations of socio-perceptual experience in digitally enhanced outdoor urban environments lack comprehensive pragmatic examination with the involvement of users as well as experts from various fields. In that sense, integrative approaches that look at the embedment of media artefacts and surfaces into traditional urban settings can provide more holistic understanding of the multiple spatial and experiential qualities of this phenomenon. This knowledge, in turn, can inform conventional urban design and placemaking practices by suggesting ways that traditional urban schemes can be updated through the application of digital artefacts. Finally, communities and governments will also benefit from these insights as their decision-making processes will then be able to involve new evaluation frameworks for urban digital technologies and, consequently, provide innovative

urban spaces which can be at the same time human-friendly and context-sensitive.

1.2 Research Approach

The focus of this research study has been to explore the changing experience of place in a selected set of digitally augmented public spaces. The notion of place represents a number of social, material, political and perceptual qualities (fig. 1.4) that, essentially, differentiate it from space (as noted in section 1.1) and will be further explored in the next chapter. Fundamentally, through place experiences users form particular types of relationships with the physical environment. This is because by navigating through and engaging with their surrounding in different ways a person creates a diversity of attachments and associations with it (Degen et al., 2017). Therefore, human experience in urban settings is critical in how people perceive and interpret these settings and, consequently, how they design and develop new ones (Thwaites and Simkins, 2007). Although there is no deficiency in the literature regarding human experience, the subject is approached from various disciplines and theoretical perspectives and, thus, it is often challenging to associate this knowledge with design principles (Kaplan et al., 1998).

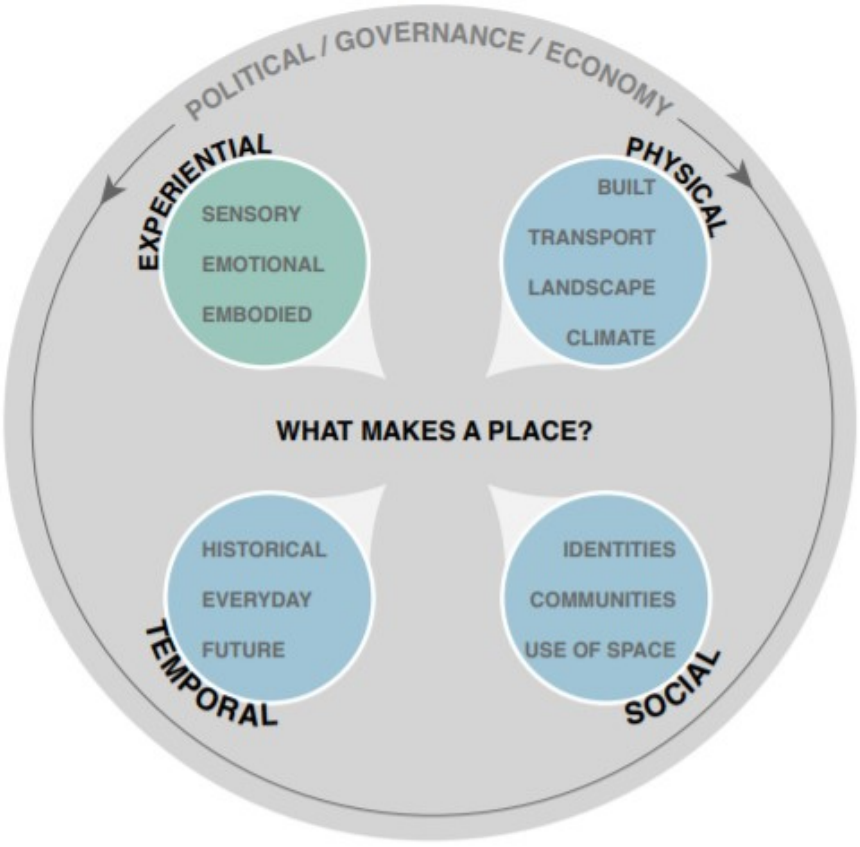

Fig.1.4 The versatile nature of Places. Adapted from Degen et al., 2017

The approach of this research study mainly builds upon what is broadly termed as *human ecology.* This is a multidisciplinary model aiming to assess the relationships between people and their surrounding space (Berkes and Folke, 1998). Its wide scope and integration of multiple research fields was considered appropriate in this study which explores the effect of a built environment enhanced by media artefacts on the human experience, performance and behaviour. Part of study's approach has been also influenced by the theory of *Experiential Landscape Place* (Thwaites, 2000; Thwaites and Simkins, 2007) which is an approach to landscape architecture which is focused on a integrated understanding of human-environment relationship. The foundations of this complex and comprehensive understanding of this relationship primarily draws from different philosophical and theoretical models which advocate that the design of open space should consider human experiential qualities as well as spatial and physical features (Merleau-Ponty,1964; Canter,1977; Alexander,1979; Tuan,1977; Walter,1988). The holistic concept of Experiential Landscape Place shares aspects of place theory and socially and human responsive approaches to urban design, especially those highlighting the purpose of design to be the creation of environments as settings incorporating both physical space and human experience (Alexander,1977; Bentley et al.,1985; Kaplan et al., 1998; Tibbalds,1992).

It becomes evident that both theoretical models noted above are fundamentally human-centred and greatly related to the multifaceted theory of Place and Place experience, which will be examined in the next chapter, forming essentially the main theoretical framework of the study. All the aforementioned approaches basically prioritize the humanistic and social role of design and place over space turning out to be influential the last decades forming the basis of several urban design frameworks (Urban Task Force,1999; DETR, 2000, Llewelyn- Daves,2000; DTLR,2001). The approach of this study aspires to develop new contributions in this field forming a place and human sensitive perspective for the assessment of the novel phenomenon of urban media installations in public space.

1.3 Research Aims, Objectives and Questions

Research Aim

Large and medium scale digital installations are becoming increasingly pervasive in urban spaces. Yet, there is currently no evaluation framework for the quality of their effect in the city, or any form of methodology for designing and planning for such urban interventions as an integral part of the urban environment.

> *"Digitally augmented space provides a challenge and opportunities for many architects to rethink their practice, since architecture will have to take into account that layers of contextual information will overlay the built space"*

Manovich, 2003: 80

Using a pragmatic approach the major aim of the study is to better understand how the various interrelated dimensions of place experience can be influenced by the application of and interaction with media installations in public space and achieve a clear understanding of how such urban interventions can deliver more responsive and human-centred environments. Ultimately, the overarching goal of the research is to investigate the multiple ways in which media art and architecture projects create, mediate and transform urban space as well as human behaviour and performance in it.

Research Questions, Sub-questions and Objectives

The fundamental hypothesis of this research is that certain types of urban media interventions have the potential to improve user's perceptual experience in public space, increase social activity in it and, ultimately, act as placemaking tools by (re)activating parts of the city. In this sense the main research question is:

How can the interaction with urban digital installations affect different dimensions of human experience in public space?

In order to respond to the key research question and overarching aim of the study, certain sub-questions and objectives have also been developed as shown in the following table:

Sub Research Questions	Objectives
1. What are the fundamental qualities of place experience and how is this formed in the context of public space?	To identify the forming qualities of (place) experience by developing a comprehensive understanding through the analysis and synthesis of various approaches to place concept
2. How can media installations influence an area's urban dynamics and human activity?	To examine the effects of the application of digital artefacts on public space activity, population as well as pedestrian flows and movement
3. What are the effects of the application of a digital installation or a set of digital installations in the social and perceptual landscape of a public space?	To explore experiential qualities of digitally augmented space both from a collective and an individual perspective
4. How can urban media interventions transform space into place? Could urban digital strategies potentially act as a innovative placemaking tool?	To investigate the transformative power of media architecture and urban media art as examine the contribution of urban media events to contemporary placemaking strategies
5. What are the characteristics of successful design, planning and application of urban digital interventions?	To establish a set of fundamental considerations for designers, planners, curators and decision-makers for the design and planning of successful and urban-friendly urban media environments.

Table 1.1 Sub Research questions and objectives

1.4 Scope of the Study

The scope of the research is as follows:

i) For the purpose of this research, the scope of the study will be on the effect of digital installations' implementation on public space experience. It will not be grounded within the fields of HCI, computer science and urban informatics as this is a. out of the academic interest of the researcher and b. it has been thoroughly explored through various previous studies (see for example Nam and Nitsche, 2014; Fortin, and Hennessy, 2015)

ii) There are many types and classifications of situated digital technologies in the context of public space. The research focus and design developed for a special form of urban digital installations that provide a certain level of experiential qualities and offer the opportunity for public engagement with them.

iii) The study focuses on the analysis and evaluation of the physical and functional features of the urban media installations as well as the type and arrangement of public space that accommodates them in order to draw fundamental conclusions regarding the quality of experience with them. This integrated analysis will concentrate on dimensions of urban dynamics, user's behaviour in space, social interaction and perceptual response in order to assess a number of different sub-dimensions of place experience that emerged through the development of study's theoretical framework. This framework has arisen though the analysis and synthesis of the concept of experience as it manifests in Place theories from various research fields. It was found that as the notion of place has been examined and interpreted by several academic disciplines, the concept of place experience is, respectively, versatile. Therefore, it was realized that a pragmatic and integrative approach was necessary.

Concerning the social dimension of experience with urban digital installations, literature review showed that their potential to act broadly as drivers for social interaction by initiating informal discussions was explored in previous studies to a great extent (Fatah et al., 2010; Hespanhol and Tomitsch, 2012; Gehring and Wiethoff, 2013; Urbanowicz and Nyka,2016). Therefore, this study will focus on different or more specific factors of social experience with media artefacts in public space (i.e social inclusion, social proxemics, playful engagement and connectedness). Essentially, it is evident through the review of the literature that an aspect that has been barely assessed is that of perceptual experience with digital artefacts in public space and, therefore, this part of analysis will gain a certain emphasis.

iv) Urban digital installations are not assessed only individually but also as parts of a wider network of interventions, in the course of an urban event, and therefore the sequence of digital experiences in different locations of a public realm is explored. The importance of this aspect is acknowledged as it was found through literature review that there has been no similar comprehensive evaluation of a set of media interventions placed on different locations of a wider public realm. In this sense, not only the interrelation of different dimensions of place experience if explored (eg. How social activity affects perceptual qualities), but also the integration and interconnection of features of the separate digitally augmented public spaces is assessed into one whole digital experience.

1.5 Thesis Structure

The thesis is structured into nine chapters. Following this introduction, *the second chapter* provides a review of the literature relating to the complex concept of Place which establishes the theoretical context and introduces the theoretical framework for the research. This chapter does not deliver an exhaustive review of place theories, yet it aims to explore the various interpretations of the notion of place experience according to the fundamental approaches to *Place*. The *third chapter* provides review of the literature relating to the topic of the study, digital technologies in public space. The chapter initially examines different classifications of physical digital technologies in urban space. Through the analysis and synthesis of the main features of the identified types it develops a new classification which is primarily based on the experiential quality of the artefacts. Subsequently, it outlines literature surrounding experiential urban digital installations from different perspectives of human experience. *Chapter four* introduces the methodology of the study outlining the philosophical assumptions regarding the use of theory and knowledge claims as well as strategies of inquiry. It also analyses the development of the conceptual framework and links it with the need for a pragmatic research approach. *Chapter five* focuses on the research design by setting the spatio-temporal context of the case study, explaining the reason of its selection and, ultimately, discussing the data collection process and methods as well as the course of data analysis. *Chapter six and seven* focus on the case studies and present the main research findings. Particularly, chapter six comprises an analysis of the embedded case study units separately, while chapter seven looks at the themes and patterns that have emerged from the analysis comprehensively, including also a cross-analysis between the case study units. Following the part of the integrated analysis, chapter eight discusses the findings of the analysis concerning the major affordances of media installations in public space experience, investigating also their potential as a tool for placemaking and some fundamental design and planning consideration for their successful implementation. Finally, chapter nine concludes the overall research and the research findings, while also setting study's limitations and directions for future research work.

CHAPTER 2

Place as Experience: Theoretical foundations of human experience through different interpretations of place

Scholars have used various terms and descriptions when investigating the relationship between people and physical environment. A major factor for this is the varying disciplines and fields of research that approach this relationship which inevitably adopt different ontological and epistemological perspectives. A rather prevalent concept that refers to human-space bonding encompassing a wide range of theories is that of *place*. Interestingly, despite the variations in study contexts that examine place, most of the approaches have a lot in common. Understanding of place can be critical for the interpretation and evaluation of human experience in urban space as its multiple individual elements can be associated with and determine human-environment transactions and subsequently quality of life in cities.

The following chapter, initially, is going to explore the notion of place experience through various theoretical approaches to place concept. Having a key focus on experience This section will not constitute an extensive and exhaustive literature review of Place theory, yet it will seek to understand the various interpretations and forming qualities of place experience through the review of the fundamental theories of Place. Subsequently, it will explore the idea of public space and its experiential dimension setting in this way a fundamental socio-spatial context for the study which will also lead to the development of an integrative theoretical framework. Finally, it will introduce the concept of placemaking as a process of designing place-sensitive and creative urban environments

2.1 The Concept of Place Through Multiple Theoretical Approaches and the Role of Experience

Plurality of Place Concepts and Approaches

> *"We call locations of experience 'places.' Experiences means perceiving, doing, thinking, and feeling."*
>
> *Walter, 1988: 117*

Although the concept of Place is frequently used and highly accepted in spatial studies, its use in not limited within the frontiers of this field. Essentially, it is a notion identified repeatedly throughout social, psychological, political and environmental inquiry. Consequently, multiple rationales have emerged for the interpretation of the concept according to the various disciplines involved.

Multiple definitions for Place have been reported, but usually the term "place" contrasted to "space", indicates a powerful affective connection between an individual or group of people and a particular environment (Sime, 1986). In other words, place integrates human values and qualities and meanings or, as Sewall (1999:167) noted "Place is a space with experience added in". Human experience in the spatial context can provide insights to encourage deeper interpretation of spaces and places, having a critical role in human life.

Evolution of ideologies towards Place research

From the perspective of the historical development of place inquiry, first studies tended to be more phenomenological (Tuan 1974, 1977, Relph, 1976), meaning that emphasis was given at the personal qualities and readings of space (Hay, 1998). This is possibly explained due to a general tendency towards humanism that occurred in the 1950's when, by that point, mostly positivist approaches were prevailing. Phenomenological studies of space were highly challenged later on for two main reasons; a) for not taking into account the social dimension of space as a setting for collective activities and experiences (Proshansky et al., 1988, Lefebvre, 1991, Soja, 19996) and b) for being too subjective and not generalizable, according to psychologists (Canter, 1977) who were supporting traditional and mostly quantitative methods for the study of place.

Lately there has been renewed attention to more holistic and phenomenological research, although positivist ontologies still exist in place inquiry (eg. Altman and Low, 1992). Interestingly, studies in the field of Environmental Psychology despite of the

frequent application of quantitative techniques to examine psychological phenomena in the environment, they are gradually moving towards further diversity in their methods using also interpretive approaches (Kolodziejski, 2014).

2.1.1 Place and Philosophy: From Plato and Aristotle to M. Heidegger

The etymology of the word “place” derives from the Greek word plateia (hodos) “broad (way)”, evolving to Old French place “place, spot” and directly from Medieval Latin placea “place” , from Latin platea “ courtyard (open space), avenue”. Besides etymology, the roots of the overarching philosophy of place can be traced back in the writings of the classical Greek philosophers Plato and Aristotle.

Plato (428–348 BC) defined the abstract meanings of “chora” and “topos”, in the setting of a rationale involving the roots of “existence” and the process of “becoming”. For Plato, “becoming” is a process that comprises of three elements, the final of which is “chora”. “Chora” refers to both the extent of space as well as the part of space involved in the process of “becoming”. The term “topos” is also equivalent to “chora”, both in opposition to “kenon” implying the void (Cresswell, 2009).

Aristotle (384–322 BC) developed further the notion of place in Greek philosophy. For him, place is the basis through which one can understand space (void) as well as change and motion. To Aristotle, place ‘‘takes precedence over all other things’’ (Casey, 1997: 71). Blending the meaning of change and motion, he used the term “locomotion” being the “‘most general and basic kind [of] change” a “change in respect of place” (Casey, 1997: 51).

The work, however, that is considered to be particularly fundamental for the evolution of Place concept especially in the field of Human Geography was that of the philosopher Martin Heidegger (1889–1976). Heidegger believed that to be is to be “somewhere” and that meaning was reflected on the term “dasein” that he invented. In the same sense, human existence for him was an existence “in the world”. Therefore “dwelling” is not solely referring to inhabit a house, but to live in a meaningful world one is attached to, or “place-like” (Cresswell, 2009:1).

2.1.2 Two Main Approaches to Place and Experience in Human Geography

Research on the evolution of human geography has identified an incoherent development: The field of geography originally emerged at the start of 19th century with the main features of environmental determinism and historicism (Warf and Arias, 2009). However, during its evolution two different approaches were gradually developed which became clearly distinct by 1970s. Phil Hubbard (2005: 41) describes them as 'two very different strands of geographical inquiry' being the humanistic or phenomenological approach and the Marxist- materialist approach. The first one asserts that different contexts have different sense of place, while the second one emphasizes on the resistance across multiple settings and spaces, supporting the idea that space is 'both socially produced and consumed' (ibid). These two distinctive focuses were directly related to their different conceptions of place and were reflected on their separate theories which will be explored further in the following sections.

a) The Humanistic- Phenomenological Approach

> *"What begins as undifferentiated space becomes place as we get to know it better and endow it with value y the ideas ''space'' and ''place'' require each other for definition. From the security and stability of place we are aware of the openness, freedom and threat of space, and vice versa. Furthermore, if we think of space as that which allows movement, then place is pause; each pause in movement makes it possible for location to be transformed into place."*

Tuan, 1977: 6

According to Hubbard (2005), geographers of the humanistic approach turned the main emphasis of Human Geography from social space to "lived-in" space. One of the most influential supporters of this approach, Yi-Fu Tuan, in his book *"Space and Place"* notes that space does not inhere size or scale, yet it is produced through emotional attachment or "fields of care", while Place is also infused with meaning (Tuan, 1977). Another famous supporter of this approach, Edward Relph, encouraged the search for more human-centred and sensitive consideration of 'the lived experience of place'. He notes that the only way for a "sense of place" to occur is the establishment of a "deep-rooted" connection between people and place (Relph, 1976). Sime (1986) suggests that for Relph, the significant power of place is its influence on human experience and behaviour expressed spatially. According to

Relph (1976) place comprises of the interaction between three elements*: 1. Physical setting, 2.Activity and 3.Meaning.*

The first approach to experience

As previously mentioned, Human Geography was initially driven by environmental determinism and historicism; therefore, terms and notions like “human experience” were not used by geographers until the 1970s. Consequently, the focus of the humanistic approach on the idea of experience was quite revolutionary. Cresswell (2009) points out that while the early spatial scientists sought to interpret the world considering people as part of that, equal to rocks and trees, defenders of the humanistic approach explored the relationship between humans and world through the “realm of experience” (p.4).

For Tuan (1977) particularly, experience constitutes a comprehensive term including all the multiple mechanisms though which a person perceives and processes reality. These mechanisms vary from the direct human senses like vision, touch and smell to indirect modes of perception and symbolization (fig. 2.1). At this point it should be noted that for Tuan emotional experience affects all human experiences like perception and conception.

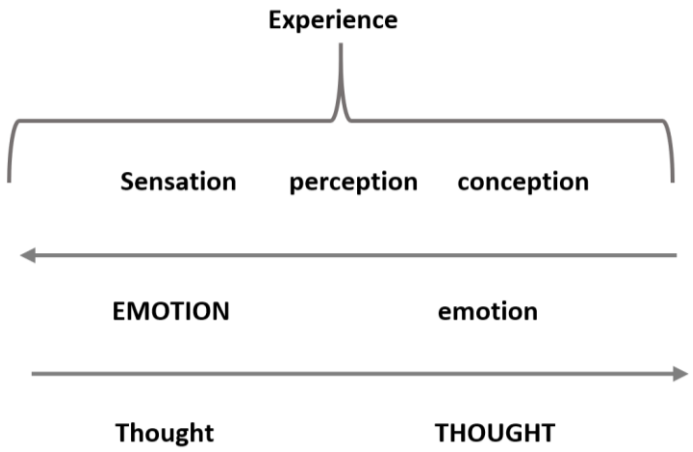

Fig. 2.1 Elements of Human Experience. Adapted from Tuan (1977: 8)

The role of experience in humanist approach is to convert *a scientific concept of space into an experiential and meaningful concept of place*. Although space is the object of research of a spatial scientist, the main focus of humanistic geography is the way that space is transformed into place through the imbuement with human experience (Cresswell, 2009). Another interesting concept in the field of humanistic geography, highly used by Tuan is that of *Embodied space* or *Embodiment in place.* Generally, by embodied space it is implied the area where human experience

acquires physical form (Csordas, 1988; Merleau-Ponty, 1964). The space is inhabited by the human body and as a result the experience of that space is developed according to a person's emotions, beliefs and self-consciousness (Low, 2009)

Developing a modern interpretation of Relph's concept of place, Wattchow and Brown (2011: xxi) note that "place is suggestive of both the imaginative and physical reality of a location and its people, and how the two interact and change each other" and therefore, for them, place experience indicates the meaning that is created through human interaction with space. In a similar sense of three dimensional interaction, Naderi (1999) sees place as the integration of three components; a) Physical setting, b)definitions and c) human behaviour, while Madanipour (1996) imagines place as part of space involving values and meanings. For Castello (2006) place is a unitary setting that incorporates the physical context and human experiences, while for Rose (1995:88) place is "infused with meaning and feeling" that they in turn shape its experience and identity. This is also considered as "sense of place", a term often used to describe the experience of a spatial setting that highly supports theoretical approaches to individual and community well-being and physical qualities.

b) The Materialist approach: Place as a social construct

Although humanistic geographers built on the idea that place is experienced and felt, they did not primarily consider on how forces are applied for the production and reconstruction of spaces and their respective meanings (Creswell, 2009). Regarding the phenomenological approach of humanistic geographers, Dovey (1999: 44), notes that "phenomenology is a necessary but limited" perspective towards the interpretation of space, since it advocates a particular "blindness" to the social setting and everyday life where place experience takes place. The basis for the understanding of place *as a socially produced space animated through human activities and actions* has been provided by "the theorists of the everyday"[1] (Bourdieu, 1977; Lefebvre, 1991; de Certeau, 1984). Although the terms space and place are some cases confused, the underlying idea is that place is created through the interaction between human actions and physical locations (Mackey, 2015).

In the sense, Lefebvre (1991), and later Soja (1996) suggest that space is perceived as a spatial and social setting which is infused with value and meanings through the everyday place-based social practices and is constructed though actions that take

[1] Refers to a philosophical trend that included theorists that sought to challenge the privileged view of social processes and order academic researchers were claimed to have. To do that they delivered methods and conceptual frameworks related to everyday world, activities and people in an effort to challenge hierarchical relation between the observers and the observed Garfinkel (1996).

place over several physical and temporal scales. They believed that place is impossible to be separated from people who create it and imbue it with meaning. As Soja(1996 in Gieryn, 2000) pointed out *"places are also interpreted, narrated, perceived, felt, understood, and imagined."*

Lefebvre (1991) identified three separate scales of space; perceived, conceived and lived. Perceived space is the one that consists of the affective and behavioural processes that surround human beings, as well as the physical articulation of practices that indicate action spaces. Conceived space refers to people's knowledge and understanding of space as a setting of ideologies generated by researchers and professionals. Finally, Lived Space, or as for Soja(1996) Third Space, is where the other spaces or consequently subjectivity and objectivity, vague and concrete intersect. This type of space is essentially experienced rather just conceived through its physicality or perceived through its mental image. This shift to the experienced world seems to develop the theoretical foundation for considering policies for place as experienced, inhabited and practiced (Cresswell, 2004)

Taking into consideration all the above, place experience from the materialist perspective depends primarily on people's actions and behaviours taking place at that setting, everyday activities and conceptions about the space as well as social and political powers forming or influencing fundamental conceptualization of the space. In these terms, place experience is never static or "established", but it is only created through "constant and reiterative practice" (Creswell, 2004:38)

The work of Lefebvre, Soja, de Certeau (1984), Pred (1984) and Thrift (1983) show how place can be created and recreated on a daily basis. Place can offer a setting for activity or as Cresswell (2004:39) commented *"an unstable stage for performance"*. Place in that sense gives the foundation for the generation of identity rather than having a priori an identity.

2.1.3 Place as Personal Expression, Pathetecture and Temporal Dynamic Experience

Americal psychologist Mayer Spivak (1973:45) made an important distinction between space and place by emphasizing its sociality:

"It is what people do in space that makes that space into place"

Proshansky, Fabian and Kaminoff (1983) believe that people define themselves socially both by their distinction from other people but also through their relation with their surrounding environment. They consider place as a significant element of self-

identity as they can influence human biological, psychological and social needs. This approach highlights the view that *any spatial environment is at the same time a social environment and vice versa*. In a similar sense, Walter (1988) added to this perspective the importance *of expressive activities and human participation* for the attainment of Place, as a space of experience. He notes that place is created through people's feelings and their emotional expressions. For him, expressive space can be both discovered and created, but in either way, spatial form as a place needs to be experienced "as the embodiment of the thoughts and feelings of those who conceived and constructed it." (Thwaites and Simkins, 2007:33). Walter (1988:143) calls this spatial form *Pathetecture*, and implies building emotion through spatial structure.

In that sense, *place experience for Walter is echoed in the notion of Pathetecture* being a process through which expressive space takes physical dimensions. Pathetecture constitutes a medium for creating place through collaborative or combative relations between people who build the physical form and those who inhabit it and share it. For Walter (1988), a space without the existence of that expressive energy is considered as *dead space* tending to produce feelings of boredom, disorder or even aggression.

> *"…a place is dead if the physique does not support the work of the imagination, if the mind cannot engage with experience located there, or if the local energy fails to evoke ideas, images or feelings" (ibid., p.204)*

Arnold Berleant's (1997) concern regarding the development of a living landscape concept as the foundation of a new aesthetic environments reflects the previous perspectives on place and experience. In the same vein as Walter, he considers inhabitation of space more than simple occupation and use of it. His theory builds on the idea that space and users constitute an integrated whole which is encompassing spatial, social and perceptual elements. Consequently, these comprise elements of human experience in space and therefore, place is considered to incorporate human features and contrariwise, humans obtain place features.

A related way of looking at the dynamic and transformative dimension of place experience is given by Massey(1997). For her, a place can integrate physical features, bodies and flows in various ways, or, as also Escobar (2001:143) asserted "places gather things, thoughts, and memories in particular configurations". Place, in that terms, becomes an event, not a permanent bounded setting, and therefore place experience is characterized by dynamism, temporality and malleability. These perspectives have been quite significant in terms of the conceptualization of place

and experience as they assert that they are both created from the outside rather from inside (Creswell, 2004). Similarly, the artist Lucy Lippard (1997:7) has also pointed out the fluidity of experience in place. For her

> *"Place is latitudinal and longitudinal within the map of a person's life. It is temporal and spatial, personal and political. A layered location replete with human histories and memories, place has width as well as depth. It is about connections, what surrounds it, what formed it, what happened there, what will happen there."*

Similarly, for Mackey (2015) place is a space animated through human activity and actions of personalization. Particularly, experience of place incorporates a number of operations and behaviours that lead to the creation of feelings, positive or negative, or psychological bonds with space. In addition, according to Seamon (2018), place can be any environmental setting in and through which individual and collective activities, experiences, feelings and values are incorporated spatially and temporally.

2.1.4 Psychology Of Place

Returning to Relph's three-facet model of place, the psychologist David Canter by building on that published *The Psychology of Place,* where he analysed and synthesized various recent studies on psychology under the idea of "Place". For Canter the concept of place integrates: 1. Actions; 2. Conceptions; and 3. the Physical Environment.

> *"It follows that we have not fully identified the place until we know (a) what behaviour is associated with, or it is anticipated will be housed in, a give locus (b) what the physical parameters of that setting are, and (c) the descriptions, or conception which people hold of that behaviour in that physical environment."*

Canter, 1977:158-159

Canter through his work highlighted the importance of understanding the view of the user. Moreover, he emphasized on the scientific measurement of the people-environment relationship, an approach that is fundamentally different from the phenomenological ones, like Tuan's and Relph,'s analysed before (22. Sime, 1986). In this regard, the core meaning of experience in place conceptually remains close to Relph's interpretation, incorporating conceptions instead of meanings. However, Canter's approach was radically new in terms of the methods to assess the experience of place suggesting a different framework, which relies strictly on

psychological techniques, largely quantitative. He believed that phenomenological approaches show several weaknesses as they are highly comprised of subjective qualities of place. Later, Punter (1991) and Montgomery (1998) drew also on Canter ideas and sought to apply the elements of place and sense of place within an urban design framework.

In the context of **environmental psychology**, though, place takes on a different meaning than in the purely psychological approach of Canter as it advocates also social process and attributes. In this sense, *place experience in environmental psychology incorporates* the interaction between people and the physical setting formed though the correlations of individual's psychological processes and social activities occurring in space (Smaldone, 2005). In the same context, for Sime (1986) place refers to a powerful, either temporary or long-lasting, emotional relationship between an individual and a specific space and, respectively, place experience represents any "positive and satisfactory" experience related to it (p.2). From a similar perspective, Rapoport (1990b) points out that the surrounding physical environment is an aggregate of four interrelated fundamental features: a. the organisation of space, b. the organisation of time, c. the interaction between people and d. the 'meaning' of the environment.

2.1.5 Place Experience in Architectural Phenomenology and Environment- Behaviour studies

"Like our intimate social bonds…our relationship with the larger world is built from countless sensory interactions...the places in our lives get 'under our skin' and influence our behaviours in ways that we don't often expect"

Gallagher, 1993: 127

An approach to the interpretation of place experience very closely related to the one of Environmental Psychology, if not identical in some cases, is the approach of (modern) Architectural Phenomenology. The term *modern* Architectural Phenomenology is used here referring to the second phase of the evolution of the field. In particular, the first phase of architectural phenomenology emerged in 1940s having strong influences from classic phenomenology. According to Pailos (2010: xxiv) the Italian architect Ernesto Nathan Rogers developed "some of the earliest contacts between architects and phenomenologists" and gathered around himself "a small but influential group of young European architects… who explored

phenomenology as an intellectual framework for rethinking modernism" (ibid). Another key figure of that school of thought were the French- American architect Jean Labatut (1899– 1986), who *considered phenomenology as a conceptual tool to conceive design schemes that enhance human experience in space*.

The second phase of or modern architectural phenomenology, began during the 1960s and comprised the evolution of phenomenology in architecture through the development of "environment-behaviour studies" ("EBS"). The latter constitutes an multidisciplinary field of inquiry and practice that became quite popular in the 1970s and 1980s (Sachs, 2013), and integrated quantitative and cognitive dimensions to the phenomenological interpretations of space. Identified differently as "behavioural geography", "human factors in design" and even "environmental psychology" (Seamon, 2019), one of the most influential thinkers of that field with strong phenomenological influences is Christian Norberg-Schulz (1926– 2000) who used the term Genius Loci (1979), or spirit of place, to refer to the relationship between human and space in daily life. Another innovative thinker of Architectural Phenomenology is the architect Alexander. In his seminal work "A pattern Language" (1977), Alexander applied the analogy of language to explore the experiential and physical features that lead to the creation of place. In a similar sense, architect Juhani Pallasmaa in 1995 published the book *The Eyes of the Skin: Architecture and the Senses* and later (Pallasmaa, 2014:20) introduced the term atmosphere which can be associated to the notion of place experience, defined as

> *"the overarching perceptual, sensory, and emotive impression of a space, setting, or social situation"*

In this regard, the experience of place or atmosphere ingrates the perceptual, affective and sensory dimensions of a space.

From a different perspective, but still in the same overarching idea of architectural phenomenology, the architect Aldo Van Eyck (1961) sees place as a meeting place for people. Giving prominent importance to human interaction, in his famous description of place he states

> *"Whatever space and time mean, place and occasion mean more. For space in the image of man is place and time in the image of man is occasion."*

Aldo Van Eyck, 1961: 293

Other proponents to the approach of place and place experience through the perspective of architectural phenomenology include Kevin Lynch(1960), and Oscar Newman (1973); the anthropologist Edward Hall (1966); psychologist Robert Sommer (1969/2007); and urbanists Jan Gehl (1987), Jane Jacobs (1961) and William Whyte(1980). Although the main focus of their perspective may vary, including stronger phenomenological, cognitive, or quantitative influences they all support a multidisciplinary approach to the design of place having as a main priority the interpretation and enhancement of the multifaceted notion of human experience.

2.1.6 The Recent Approaches To Experiential Qualities Of Places

Generally, the recent approaches to place concept have frequently emphasized its inseparable value. Therefore, the need for interdisciplinary research has frequently been mentioned, as for example in Jessop et al. (2008). Although the main research focus of the study is based on the socio-spatial qualities of place, the researchers point out that various approaches and methods need to be applied when exploring place. Furthermore, recent discussion on the ontological status of place mention several objective as well as subjective features of it, concluding that place should be regarded both as a foundation of social activity and relations but also as a product of them (Conradson, 2005; Johannesdottir, 2010). In a similar sense, Raffaeta and Duff (2013) in agreement with Lund and Benediktsson (2010) who consider place as “more-than-human-materiality” (p.1), identify three fundamental dimensions of place; a. the relational, b. the social, and c. the affective which underline the complexity and plasticity of the nature of place experience.

Moreover, Hunziker et al. (2007) associate place with the concepts of self-reflection - related to individual experiences and achievements- and the level of social integration linked to personal and social values, norms and meaning. In this sense, for them place experience is fundamentally based on individual experiences, cultural values and social qualities.

a) Experiential Landscape as a concept and framework

Thwaites and Simkins introduced “experiential landscape place” (2005) and “experiential landscape” (2007) as a conceptualization of the “a holistic relationship of outdoor open space and human experience” (p.xi). They consider Experiential landscape as a concept of physical and experiential entity consisting of outdoor spaces people use in their everyday life, or public space, and they develop a conceptual framework for the evaluation of human experience spatially as four elements called centre, direction, transition and area (Thwaites,2001). It is noteworthy

here that Experiential landscape is not regarded as an accumulation of separate locations joined together, rather as a whole of diverse spatial forms experienced sequentially. This is similar to what Cullen (1971:10) thought of a town as “a journey through pressures and vacuums, a sequence of exposures and enclosures, of constraints and relief”.

Their conceptual framework identifies three major dimensions of experience related to the residential context and conceptualises these in terms of spatial elements. These main experiential dimensions include: a. attachment of significance to locations, b. orientation and c. development of awareness (Thwaites and Simkins, 2005)

b) Place and Wellbeing

Relatively recent efforts to place interpretation consider it as a space which fosters and provides experiences of health and well-being. These efforts again derive from multiple fields which include research in environmental psychology and “restorative environments” (Kaplan, 1995; Korpela and Hartig, 1996; Hartig and Staats, 2003), works in geography on “therapeutic landscapes” (Gesler, 1992; Williams, 2007), studies in psychiatry on “enabling environments” (Tawil et al., 1995) and multiple interdisciplinary studies that relate spatial elements of place with various aspects of human experience in space such as psychological arousal (Ellard and Montgomery, 2013), evocation of feelings, social connection, creation of meanings and sense of belonging in place (National Trust, 2017), perceptions of social trust, feelings of fascination and mood trends (Happier by Design, 2017) and feeling sharing with strangers and sense of altruism (Happy City, 2018).

The aforementioned efforts, and generally the recent approaches to place, suggest that human experience needs to be considered as a fundamental element of it and vice versa, deeply involved in the process of meaning and identity creation, mental and psychological well-being, community feeling and health (Raffaeta and Duff, 2013)

2.2 Public Space as Place and Contemporary Placelessness

2.2.1 Public Space as Place

Cities are complex systems comprised of financial, industrial, political and communication components and networks, and therefore one might believe that a socio-psychological approach is less significant. However, as Sophocles stated long ago, *"the city is people"*, and as city experience is able to form citizen's behaviour, relationships and attitudes, the importance of the design of urban spaces is critical (Gifford, 2014: 419). The criticality is even higher in terms of public space design and its articulation, as this is where the urban life takes place, where citizens can enjoy their favourite activities, while having opportunities to interact with each other.

There is a variety of public space definitions within the wider built environment literature. For example, Edwards et al. (2013: 23) define it as 'spaces reserved for the provision of green space and natural environments, accessible to the general public free of charge', while London Assembly (2011:47) considers it as 'all spaces including streets, squares and parks that everyone can use and access in principle, regardless of who owns or manages the space.'

The definition which mostly aligns with the scope of this study is developed by Carmona et al. (2010:5) as following:

> *"all those parts of the built environment where the public has free access. It encompasses: all streets, squares and other rights of way, whether predominantly in residential, commercial or community/civic uses; the open spaces and parks; and the 'public/private' spaces where public access is unrestricted (at least during daylight hours). It includes the interfaces with key internal and private spaces to which the public normally has free access."*

Carr (1992) considers public space as a fundamental dynamic complement to the more static and settled everyday spaces and routines, offering channels for flow and movement, nodes od social interaction and shared encounters, as well as a stage for relaxation and play. Public spaces witness the liveliness and tension of a city, operating as social and spatial coordinators (Hanafi et al., 2013). A successful public space provides identity for an area and positive experiences for its users. Particularly, for Jane Jacobs (1960) public space should be able to narrate the story of a place, promote human encounters and provide various potential uses of space according to user's requirements at that moment.

People have important relationship with public spaces as they experience them on an everyday basis. In his study, Hall (1966), explored the impacts of public spaces on public human behaviour. Particularly, he found that these spaces can satisfy critical human needs, convey unique cultural identities and protect basic human rights. Further assessment of the role of public space as a versatile experience in the city has considered it as a node where city's physical and social functions meet and feelings of pleasure, safety, boredom, fear or excitement are created (Lynch, 1960; Carmona et.al, 2003). These theories have set the foundations of the development of design frameworks that can improve human public behaviour, social connectedness as well as individual and community wellbeing (Ding and Guaralda, 2011)

"We need to improve the design of public spaces and, as a consequence, the quality of our lives in cities."

Rogers, 2010: vi

Spatial Typologies

In terms of their physical form, public spaces can be classified into four major types. The first type refers to the streets involving various channels of circulation and their respective formative elements such as boulevards, pedestrian routes and paths. The second type includes the squares and plazas. The third type involves parks, urban gardens, green pockets and recreation grounds, while the fourth type involves water edges and spaces leading to water element (Moughtin & Mertens, 2003).

A public space classification based on its experiential quality

In an attempt to classify public space in terms of the various place experiences that it can provide, especially from the perspective of social engagement and space perception, Dines & Cattell (2006) identify five main types:

- *Everyday* places; the set of ordinary neighbourhood public spaces that cover a great part of city's public realm and constitute common spots for daily local interaction.
- Places of *meaning*; these may vary according to personal associations and positive or negative meanings inscribed to a space
- *Social* environments; public spaces the design of which strongly encourages formal and informal human encounters.
- Places of *retreat*; the spaces that provide their users the opportunity to relax and reflect alone on their thoughts or to communicate in small groups of people they already know.

- *Negative* spaces; where are frequently notes incidents of antisocial or generally negative behaviour and are often perceived as dangerous.

The authors also point out that, realistically, none of these types is exclusive. A public space may at the same time or under special circumstances be social, everyday and place of meaning.

Building one the aforementioned categorization and taking into consideration the literature review on the concept of place and place experience, one more type of public space could be added here:

- **Public space of weak/neutral place experience or "placeless"** (Relph, 1976) public space. This could be the type of large-scale, civic pubic space that does not necessarily promote negative or antisocial behaviour, however it suffers from the lack of stimulating and pleasant sensory and perceptual experience, space animation and social interaction. A public realm which is not associated with special meanings by the majority of users and does not have distinctive character and identity. In other words, it can be considered as a public space that lacks what Jane Jacobs (1961, 1969) termed as urban or feel-good "buzz" and it is often is described as characterless, dull, boring or just placeless.

The concept of *placelessness*, as well as its main drivers and consequences, is going to be explored further in the section that follows.

2.2.2 Placelessness: The absence of place experience in public space

The term "placeless" was first used by Relph in his book Place and Placelessness (1976). The main argument of the book is that spaces are becoming placeless due to several factors such as increased world mobility, mass production and also due to a focus on 'disneyfied' and 'museumified' public spaces which are fake representation of more successful originals. In a similar sense, Marc Auge (1995) used the term "nonplaces" referring to spaces such as places of transit and airports, which do not have a clear identity themselves but are constantly related to other spaces indirectly. Although these places are not considered as inauthentic or fake, they are still opposed to the humanistic perception of place being a space that offers meanings, satisfies human needs and promotes human experience. Placeless spaces and nonplaces are characterized by constant transient flows, lack of human-space bonding and lack of spontaneous human interaction that lead to the deterioration of social connections and connections between people and their surrounding environment (Cresswell, 2009)

In general, the negative perceptions of public space started in the early 20th century with authors, for example, as Simmel (1903) and Wirth (1938) claiming that life in them was deteriorating due to societal over-stimulation caused by large and mixed population. Negative effects are also mentioned, more recently, by authors like Sennett (1977) and Oldenburg (1989) who identify a decline of public space as well, but they base it more on a spatial under-stimulation in cities which are gradually becoming dull, characterless and without proper spaces for human interaction. Ultimately, several studies suggest that, although urban populations grow, citizens become more isolated and detached from public spaces than in the past (Aelbrecht, 2016).

Drivers and consequences

Placelessness is associated with a lack of meaning (Carmona et al., 2003), identity, attachment and, ultimately substantial experience in space. Incorporated with a "narrative of loss" (e.g Arefi, 1999; Banerjee, 2001), there has been progressing interest in its main drivers as well as consequences. Generally, although several aspects have been acknowledged to lead to the contemporary circumstance of placelessness, five correlated phenomena will be briefly introduced here: *a. globalization; b. the emergence of mass culture; c. the loss of attachment to territory, loss of space personalization and self-expression; d. urban regeneration strategies, e. Advancements in information technology, digital communication and rise of social media.*

- Globalization and space homogenization

The phenomenon of globalization and the development of global space through enhanced communications has been often accused to promote movements towards space homogenization and loss of place meaning and character. Standardization along with the shifting and usually unstable relationship between the global and local contexts results in multiple negative impacts on what comprises the experience and value of place (Carmona et al., 2003; Shim and Santos, 2016)

- The emergence of mass culture and uniformity

Another factor related to globalization is "mass" culture, as a result of a broad mass production, adverting and marketing strategies, which also standardize routines, cultures and spaces sabotaging locality and place uniqueness. For Crang (1998:15), placelessness can be considered as the situation where the local, alleged "authentic" forms of culture which, enhance local uniqueness, are gradually replaced by mass-

produced profit-making schemes. Relph's (1976:92) perception is that placeless spaces derive from "manufacturers, governments, and professional designers and are communicated through mass media. They are not formulated by people. Uniform products and places are created for people of supposedly uniform needs and tastes, or perhaps vice versa".

- Urban regeneration strategies

During the 1970s urban regeneration processes started to become quite popular, especially in western contexts. In light of this, Jane Jacobs (1961) emphasized that it is of crucial importance that transformations should be gradual and not excessively drastic in order to avoid what she called "the sacking of a city" referring to the loss of a city's special qualities. In other words, urban regeneration should involve practices that aim to transform the built environment, usually in order to activate the economic and residential development of an area, while retaining the areas "feeling" (Jones and Evans, 2013). The urban environments that are most commonly undertaking regeneration processes are those that expand and grow at a fast pace. The resulting new developments have often a monotonous and typical form (Octay, 2002).

Various examples of standardized and uniform places can be frequently observed as results of urban regeneration processes. It is frequently claimed that such processes taking place in various settings, especially in more traditional or local ones, have negatively affected place identities and meanings of transformed or reconstructed spaces (Ujang and Zakariya, 2015). Particularly, Sephton (2011) notes that urban regeneration often leads to placeless urban settings even in areas that are valuable and significant to the citizens having threatening effects in site's place experience.

In that sense, Carta (1999:112) noted that urban regeneration strategies need to identify the unique features of each setting and adapt the to the new schemes according to the progressing requirements of an environment, maintaining the distinctiveness and inherent values, which can enhance collective identity and create unique place experience. In terms of collective identity, Aldo Rossi (1982) highlights the importance of creating collective memories in order to shape it.

Punter (2011:16) referring to the most typical feature of regeneration schemes, high rise apartment buildings, characterizes them as "the biggest design failing" being "widely criticised for their poor architecture, build quality and urban design. He emphasizes that many have had problematic impacts and presented significant failings in terms of liveability, streetscape and neighbourhood amenity" diminishing place experience. Academic researcher and neuroscientist, C. Ellard (in Smith,

2018), has also noted that various high-rise building flats are “alienating” since their users can have interaction with their neighbours only during their brief stays in the shared areas such as elevators and corridors, while also due to the high number of occupiers of such blocks users are very likely to meet different people every day. This has as a result people not being able to feel close and create intrinsic relationships with their neighbours leading often to *social isolation* (Gifford, 2007).

- Loss of attachment to territory, loss of space personalization and self-expression

Placelessness can be also an effect of the inadequacy of spaces that we deeply engage with, enjoy or care about. Such environments that lack the feeling of territoriality, personalization and self-expression encourage what Relph called “existential outsideness” implying that people do not care for spaces that they feel they do not belong to (Crang, 1998:112). Churchman and Sebba (1983:191) define territorial behaviour as “the behaviour of an individual, or group, claiming control over a particular area”. Personalization of space suggests the long or short lasting marking or modification of a spatial form or function in a way that shows an individuals or group’s identity (Gifford, 2014), while localised expression refers to the activites taking place in a space that are significant to the users, enhance their sense of belonging to the area and determine local identities (Thwaites et al., 2013). Personalising public space and living environments in general results not only for users showing to others who they are but also encourages self-awareness and realization as well (Gallagher, 1993). Thwaites et al. (2013:44) emphasize that public space need to be configured in that way so as to promote and facilitate self-expression, territorial behaviours gestures of personalization in order to offer “texture and life to an urban order”, or in other words, to create and enhance a rich place experience avoiding placelessness.

In the sense of placelessness and territoriality in public space, as well as the opportunities that can be created for social connectedness, Collin Ellard (cited in Smith, 2018:1) notes:

> *“The availability of public space, truly public space in which we feel joint ownership along with other citizens, is decreasing in cities. […] The value of such spaces is that, when they are working well, they afford us with opportunities to mingle with others, hopefully doing something fun, and to recognise our similarities with others rather than our differences.”*

- Advancements in information technology, digital communication and rise of social media

> *"A place where people come together, face-to-face. The [city] center is the place for news and gossip, for the creation of ideas, for marketing them and swiping them, for hatching deals, for starting parades. This is the stuff of the public life of the city—by no means wholly admirable, often abrasive, noisy, contentious, without apparent purpose. But this human congress is the genius of the place, its reason for being, its great marginal edge."*

Whyte, 2009 [1988], :341

Personal, face-to-face communication and engagement into physical activities, interaction and human encounters is one of the most important qualities of place experience in public space and one of the fundamental reasons for its existence. However, the emergence of digital technologies such as mass media, Internet, smartphones, social media, digital platforms and networks have often been associated with the tendency of people to spend leisure and even work time at home (Graham and Marvin, 1996; Cela, 2015). Placelessness a common effect of these developments as people usually tend to prefer digital interaction with others over the traditional face to face contact which frequently takes in public space. Castells (1989:6) referring to the impact of digital technology on the configuration of space and place experience stated that "spaces of flows" now dominate the "spaces of places". Besides fighting placelessness, face-to-face communication, either verbal or visual, has proved to be beneficial for individuals in terms of personal development, social success and psychological status (Knapp & Hall, 2010)

The Consequences

Placelessness affects the quality of public space in a city (Octay, 2011). As this phenomenon threatens multiply the urban identity, character, meanings and the overall experience of place, individuals that accommodate placeless public realms lose their ability to create feelings for the spaces, show less willingness to engage in human encounters or activities there and eventually they result being unable to collect and recall any experience from that location (Hull et al., 1994). Generally, when place bonds decline, place-tied communities and social connectedness weaken as well (Shim and Santos, 2014). Deterioration or absence of distinctive and authentic public space in an urban environment, which is also associated with low diversity and high singularity may cause physical, psychological and social displacement, the

extent of which depends on the opportunity for control and personalization over space as well as the degree of changeability (Fullilove, 1996; Gu & Ryan, 2008).

2.3 The Theoretical Approach: An integrative place-oriented approach to human experience in public space

The previous review of the ideas of place and experience through the multiple theoretical perspectives introduced, determined and shaped the discussion of human experience in this study. The major approaches including key concepts and interpretations based on the area of inquiry are summarized below in table 2.1.

Theoretical Approach		Key Concepts	Interpretation of Place	Place Experience	Authors
Philosophy		**Plato** (428–348 BC) "Chora", "Topos", "Becoming", "kenon"(void) **Aristotle** (384–322 BC) "Locomotion" **M. Heidegger** (1889–1976) "Dwelling", "dasein"	**Plato** Chora/ Topos is the place in the process of becoming **Aristotle** A necessary starting point from which it is possible to understand both space (the infinite, the void) and movement and change **M.Heidegger** "Dwelling describes the way we exist in the world – the way we make the world meaningful, or place-like" (Creswell, 2009: 4)	**Plato** "While kenon is limitless space chora and topos are finite and contain things. **Aristotle** Dynamic relationship between time, motion, change and Place. Place as a setting for locomotion **M. Heidegger** Human existence is existence 'in the world' (Heiddgger, 1971)	Casey, 1997 Heidegger, 1971 Creswell, 2009 Duhem, 1976
Human Geography	Humanistic Phenomenological	**Lived-in space** **Embodied Experience** **Sense of Place**	Place is imbued with meaning Interaction of three components i.e. 'physical setting', 'activity' and 'meaning' (Relph, 1976)	**Yi-Fu Tuan** a)Experience is formed through sensation, perception and conception for the construction of reality b)Emotion tints all human experience **E. Relph** Importance of human-centred and empathetic understanding of 'the lived experience of place' **S.M. Low** Embodied space is the location where human experience and consciousness takes on	Tuan, 1979 Hubbard, 1990 Relph, 1976 Low, 1988,

				material and spatial form	
	Materialistic	Place as a **social construct**	Place as socially constructed and animated through repeated operations and actions Lefebvre(1991) and Soja (1996) Place **includes 3 different scales of space: Perceived, Conceived and Lived**	Experience is the interaction of human behaviours and physical locations and it is the basic premise for the construction of space/place	*Bourdieu, 1977* *Lefebvre, 1991* *de Certeau, 1984* *Soja, 1996* *Harvey, 1993*
Social Psychology **Sociology**		Self-definition through contact with space and objects in society (Proshansky, Fabian and Kaminoff, 1983) "Pathetecture" (Walter, 1988) "Living landscape" (Arnold Berleant, 1997)	Places are considered meaningful to the processes **of self-identity** (Proshansky et al., 1983) Place as the setting of peoples' **feelings and emotional expressions** (Walter, 1988) Place as an **integrated whole consisting of physical, social, and perceptual features** (Berleant, 1997)	**Proshansky et al.,1983** Places experience is significant in the satisfaction of biological, social, psychological, and cultural needs. **Walter, 1988** **Place experience includes human participation and expressive action** **Pathetecture implies that the physical form of a space can be experienced as the embodiment of the thoughts and feelings** **Berleant, 1997** Experience in place is an integrated whole consisting of physical, social, and perceptual features	Proshansky et al., 1983 Walter, 1988 Berleant, 1997
Psychology		Place can be understood though associated "behaviour", "physical parameters" and people's "descriptions" (Canter, 1977:158)	Place is a combination of **actions, conceptions and the physical environment**	**Scientifically measured** the relationship between people and physical environments	Canter, 1977
Environmental Psychology		Constantly changing and reciprocal relationship between people and space	Place consists of four elements: space (organisation of), time (organisation of), communication (among people) and meaning (communicated from the environment) (Rapoport, 1990b)	The **interaction** between people and the physical setting formed though the correlations of individual's **psychological processed and social activities occurring in space (Smaldone, 2005).**	Rapoport, 1990b Bell et al., 1996 Smaldone, 2005

Phenomenology in Architecture	Alexander, 1979 "Patterns" Norberg-Schulz, 1976 Genius Loci Aldo Van Eyck, 1961 Dual and Dialogical nature of Place Gernot Bohme(2014) and Pallasmaa (2014) "Atmospheres"	**Norberg-Schulz** "The spaces where life occurs are place. **A place is a space which has a distinct character**" (1976:5) **Aldo Van Eyck** "Space" is turned into "place" by being construed "in the image of man," and since man is dual and dialogical, a place should be too (1960) C.Alexander **Place as a combination of physical and experiential patterns**	Experience as the **main factor for the transformation** of a space into a Place (Gussow cited in Manzo, 2003) Experience is the "that **total impression** that is regarded as characteristic" of a place (Bohme, 2014:96) Place experience is "**the overarching perceptual, sensory, and emotive impression of a space**, setting, or social situation "(Pallasmaa, 2014:20)	Norberg-Schulz, 1976 Alexander, 1979 Manzo, 2003 Bohme, 2014 Aldo Van Eyck , 1961 Pallasmaa 2014
Contemporary integrative approaches	Sense of value and meaning (Madanipour, 2000) "therapeutic landscapes" (Gesler 1992; Williams 1999; Williams 2007) "restorative places" (Hartig and Staats 2003; Korpela and Hartig 1996)	Place **as resource with material dimensions, alongside relational, social, and affective constituents** (Lund and Benediktsson,2010) Place as a part of the space with a sense of value and meaning (Madanipour, 2000) Place as the result of the interaction of three components: human behavior, definitions and physical features (Afshar Naderi, 1999) Place is any environmental locus in and through which individual or group actions, experiences, intentions, and meanings are drawn together spatially and temporally (Seamon, 2018)	**Human experience is a main constituent of the Place which along with the physical form create a unitary context** (Castello, 2006) "Therapeutic", "Restorative", "Enabling" Places Experience as fundamental feature of Place deeply implicated in the processes of identity formation and belonging, health, and well-being	Conradson 2005 Johannesdottir 2010 Lund and Benediktsson, 2010 Madanipour, 2000 Gesler 1992 Williams 1999; 2007 Hartig and Staats 2003 Korpela and Hartig 1996 Seamon, 2018 Castello, 2006 Afshar Naderi, 1999 Sime, 1986

Table 2.1 Matrix showing the organization of the (foundations of) first approach to the theoretical framework

Interrelated themes in the description of human experience across Place theories

The theoretical approaches to Place concept discussed in the previous sections have been selected according to their relevance to the fundamental aim of this study and the research objectives framed in Chapter 1. Through this review it can be noticed that, regardless the field of inquiry or theoretical foundations of each approach,

several interrelated themes exist in the description and interpretation of the ideas of place and place experience. First, although various scholars from different theoretical backgrounds have tended to distinguish components of place, the literature has shown that these elements remain closely interlinked (physical, contextual, affective, cognitive, social). Despite the prominence of different components based on the theoretical and philosophical context, a powerful experiential quality is what differentiates space from place and, ultimately, forms place experience. Therefore, as also seen in table 2.1, place experience may either describe for example the sensation, perception and conception of a context as well as the emotional ties with it (human geography-phenomenological approach), or the interaction of human behaviours and physical locations (materialistic approach), or the scientifically measured relationship between people and physical environments (psychological). In any case, place experience is reflected on a dynamic relationship between unique elements of human existence, either individually or as parts of a social structure, located in a particular context. Furthermore, these elements act both as distinct experiential qualities while at the same time, being strongly interlinked, as a dynamic comprehensive entity.

Generally, perspectives on the notion of place and subsequently place experience can be broadly classified into four major theoretical approaches (fig. 2.2); phenomenological, critical, positivist and the integrative ones which have emerged more recently. Phenomenological interpretations of place mainly express individual experiences with them, while positivist approaches primarily rely on the quantitative and objective evaluation of these experience with a tendency for generalization. Critical theories, finally, perceive place as a setting for human empowerment and domination of human freedom in all forms (Tipps, 1973).

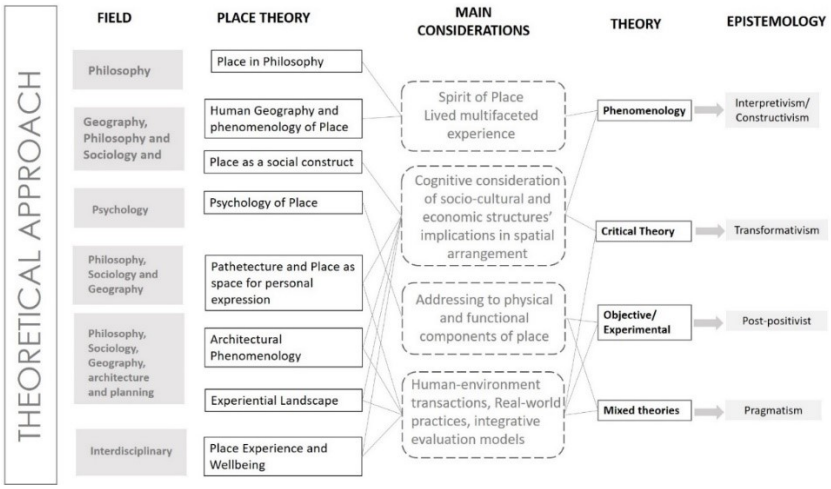

Fig.2.2 Place theories and philosophical background

2.3.1 Place Experience in Public Space

As seen in previous sections, for the scope of this study the spatial context of place discourse is urban public space. Therefore, the theoretical approach of the research which involves and integrates theories of place is also reinforced by key approaches to public space as discussed in section 2.2.

Theoretical context	Public space as Place	Author
Environmental Psychology	Critical part of urban experience able to form citizen's behaviour, relationships and attitudes	Gifford, 2014
Public Sphere (Urban studies, planning and social science)	A fundamental dynamic complement to the more static and settled everyday spaces and routines, offering channels for flow and movement, nodes od social interaction and shared encounters, as well as a stage for relaxation and play	Carr, 1992
Public Sphere (Urban studies, planning and social science)	Witnessing the liveliness and tension of a city, operating as social and spatial coordinators	Hanafi et al., 2013
Public Sphere (Urban studies, planning and social science	Should be able to narrate the story of a place, promote human encounters and provide various potential uses of space according to user's requirements at that moment	Jane Jacobs , 1960
Cultural anthropological	Impacts on human behaviour; Public space can satisfy critical human needs, convey unique cultural identities and protect basic human rights.	Hall, 1966

Table 2.2 Matrix showing some fundamental approaches to public space from various theoretical backgrounds

Combination of previous theories (table 2.2) leads to the realization of various elements that fundamentally form a positive place experience in public space and encourages the understanding that urban quality should be considered in much broader terms than pure physical configurations. Figure below is **a composite derived model, combining all the formative elements of place experience in public space discussed so far. We can use this to identify more precisely the amalgam of qualities which produce positive experiences in places of public realm.**

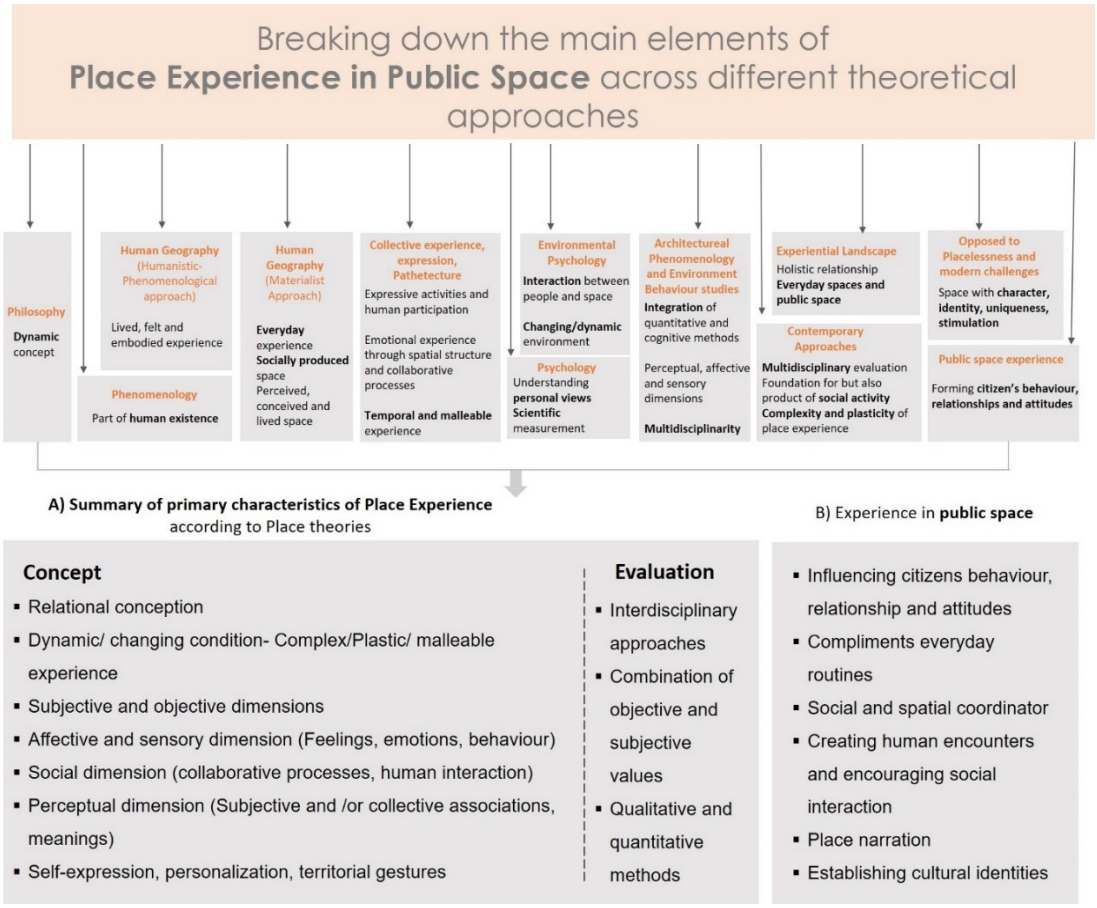

Fig.2.3 Matrix showing all concepts and features related to place experience in public space according to various research fields

In the context of this study, place experience is considered as *the reciprocal, dynamic and inseparable contact with a space and its elements which encompasses both subjective and objective features affecting human behaviour and interaction with this environment and is also developed upon three major dimensions; spatial context, social activity and perceptions*. This conceptualization of human experience in place can be associated with Sack's (1993) perspective about people's relationship with space advocating that people act as physical, social and intellectual beings establishing in this way multiple and reciprocally formative contact with places.

2.4 From Place Theory to Practice

"Place –on no matter what scale- is one thing. Creation of place is quite another. That creation is accretive and continuous, it occurs across time. It is liable to owe as much to serendipitous juxtapositions and to malign interventions as it to wilful design"

Meades, 2011:12

As discussed in section 2.2, public space is a vital part of the city which highly related to social, psychological, economic and cultural aspects of everyday life in it. Yet, in the last decades these critical parts of the city often face serious forms of decline which in turn result in states of placelessness, neutrality and generally the creation of negative effects for the urban environment but, most importantly, for its people.

The fundamental significance of considering and prioritizing human experience in the design of places has been broadly recognized in architecture and urban design studies. Essentially, a primary goal of contemporary urban design involves the provision for spaces in the city with high quality of life where people feel comfortable, safe and attracted to. In this regard, the following section will briefly introduce the concept and strategy of placemaking, exploring its critical contribution to the creation of human friendly and experientially rich urban environments, while particularly focusing on the significance of adaptive and creative interventions in public space.

2.4.1 The Concept of Placemaking

Re-establishing quality of place, particularly in public space, is a fundamental common objective between various normative theories and frameworks of urban design over the last decades (Oc and Tiesdell, 1997; Aravot, 2002). Placemaking process particularly reflects this objective, as this approach of urban has as an ultimate goal the creation of Quality Places. That refers to environments that are vibrant, visually attractive, diverse, safe and human-friendly (Wyckoff, 2014).

Although the term *Placemaking* became popular mostly during the 1990s, the main concept behind this strategy traces back to 1960s when the famous authors and scholars Jane Jacobs and William H. Whyte introduced the novel approach about designing human-centred cities instead of environments mainly focused on cars and retail centres. Their work fundamentally concentrated on the social and cultural significance of vibrant neighbourhoods and welcoming public space. Jacobs particularly emphasized on the importance of people taking ownership of their streets

while Whyte focused on key principles for the creation of socially active public realm (PPS, 2007).

Placemaking is an underlying idea and a “hands-on approach” for the reconfiguration of urban settings, aims at the reinvention of public space as the core of every community (PPS,2007). Therefore, this human-centred approach to urban design involves not only the planning but also the management, programming and maintenance of site. Furthermore, people-oriented site analysis has a prominent role in this process, taking place through careful observation and study of residents’ life, daily experience and aspirations in order to identify the primary needs of the community (Stewart, 2010). This collaborative practice (fig. 2.4) aims to reinforce the connection between people and urban spaces they use and share, shaping city’s public realm in order to facilitate diverse and creative models of use, enhance human interaction and establish cultural, social and spatial identities (PPS, 2007). In this sense, the role of human experience from all different perspectives (social, conceptual, perceptual) is clearly prominent in this process.

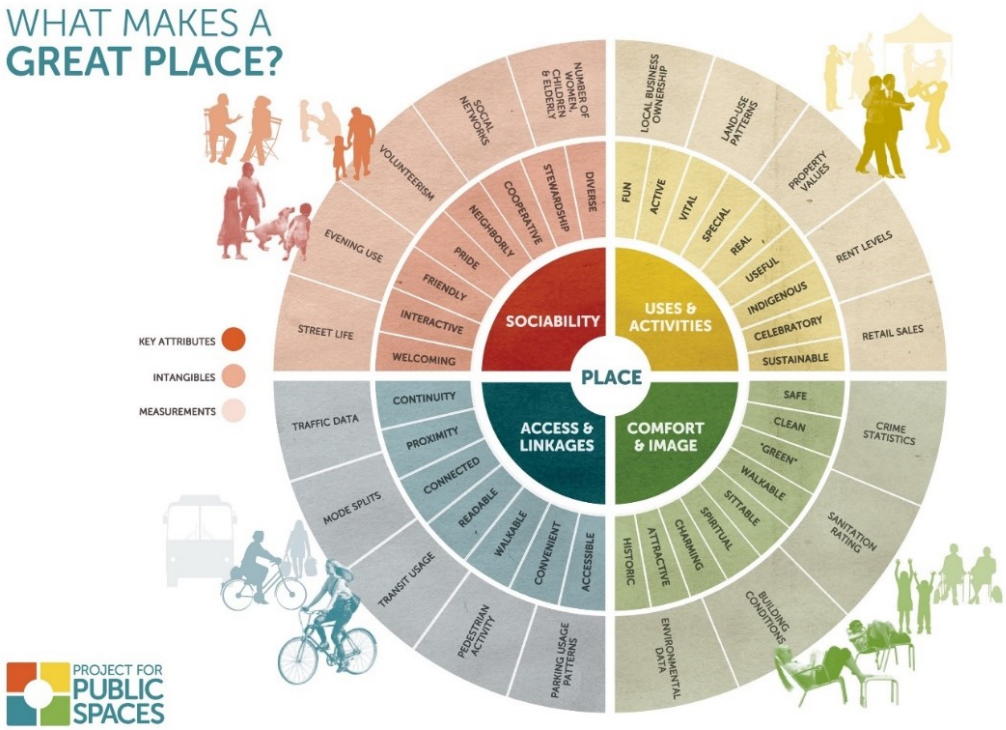

Fig. 2.4 The ‘Place Diagram’ showing the key attributes and intangible qualities of places according to PPS (2009)

a) A Primary Goal: Creating Vibrant destinations

Cities require the existence of destinations in order to be successful. Therefore, the primary goal of placemaking is the creation of vibrant destinations that give urban environments character and identity, are able to invite people to use them and stay longer, while also attracting new investments and businesses (PPS, 2016). Contextually, destinations can be formed at any public space of the city like central square, a main street or waterfront, however what transforms these contexts into urban vibrant destinations is the amount of people that visit them have social interactions there as well as space's character and general "atmosphere" (Pallasmaa, 2014). A concept related to the idea of vibrant destinations and place atmosphere is the idea of "urban buzz". Urban buzz is the phenomenon that refers to intensive human interactions in a compact urban setting, especially through physical face-to-face communication (Arribas-Bel et al., 2016). According to PPS and UN-Habitat(2012) adding multiuse and multiple destinations into the city grain can benefit local economies, build civic pride (Collins, 2016) and social connection and even enhance human happiness.

Furthermore, according to Campbell and Cowan (2000) urban attractors and destinations form city's focal points that enhance legibility and assist user's navigation through the creation of viewpoints and visual links between places. According to Ramadier and Moser (1998), spatial configuration is coherent and human behaviour is more sociable in context where physical codes and artefacts are imageable. This is also in line with Lynch's (1960) notion of place imageability which emphasizes the crucial role of five main elements of the city (paths, edges, districts, nodes, and landmarks) in helping people to create a strong and effective city image.

Also, according to Madanipour (2006) establishing city destinations through placemaking enhances the local character of each place, which is particularly vital due to the dominance of global cultural patterns both in terms of cultural preservation but also economic viability.

b) Main Principles

In the book *How To Turn A Place Around (2000, 2018)* PPS identifies 11 key principles through which placemaking projects can transform any type of public space into a vibrant community core, which will be found below (table 2.3). They have also classified these principles into 4 main stages of placemaking being the main underlying ideas, planning and outreach techniques, translation of ideas into action and finally implementation.

1. The Community is the Expert- Refers to identifying the assets and strengths of people within the community who can provide their experience and knowledge on how the area functions, its main issues and needs

2.Create a Place, Not a Design- Introducing physical components that will make users of the area feel welcome, safe and comfortable

3.Look for Partners- Collaborating with individuals or teams from various fields that will provide their support for the implementation of the project

4.They Always Say “It Can’t Be Done- Overcoming obstacles in the implementation process and aiming at small-scale feasible intervention that can provide common ground between all different associated part such as designers, engineers, stakeholders, investors, transit operators etc.

5.Have a Vision- Emerging directly from the needs and aspirations of each individual community

6.You Can See a Lot Just By Observing- .”- Looking carefully at users’ behaviour to understand what is missing and what type of intervention should be integrated into the design scheme

7.Form Supports Function- Refers to the input from the community, understanding of how each particular context works and testing as a priority over purely formalistic characteristics

8.Triangulate- "Triangulation is the process by which some external stimulus provides a linkage between people and prompts strangers to talk to other strangers as if they knew each other" (Whyte, 1980).

9.Experiment: Lighter, Quicker, Cheaper- Prioritizing short-term improvements that can have direct results and can be also tested and refined over longer periods.

10. Money Is Not The Issue- Given that the basic infrastructure of the space has already been developed, placemaking interventions will have a much lower scale and cost. Additionally, the benefits gained in terms of human experience in pubic space outweigh the expenses of the project

11. You Are Never Finished- Flexibility is necessary and ongoing attention is required in order for the placemaking projects to be able to address the constantly evolving and changing requirements of the community

Underlying Ideas	Planning & Outreach techniques	Translating ideas into action	Implementation
1. The Community is The Expert	5.Have a Vision based on community needs	7.Form Supports Function	10. Money Is Not The Issue
2.Create a Place, Not a Design	6.You Can See a Lot Just By Observing	8.Triangulate	11. You Are Never Finished
3.Look for Partners		9.Experiment: Lighter, Quicker, Cheaper	
4.They Always Say "It Can't Be Done."			

Table 2.3 11 principles for placemaking according to PPS (2007)

By looking carefully at the main ideas that form the key principles of placemaking we can realize they are mainly grounded in three fundamental aspects:

a) **Emphasis on people** (principles 1,3,5,6,8)

From all factors discussed above it is clear that placemaking as a bottom-up process primarily aims to consider and respond to human needs in the city. To do that, it encourages community enagegement and empowerment promoting at the same time team work and partnerships in order to ensure plurality of perspectives high quality design schemes.

b) **Appreciation of the local context** (principles 1,2,5,6,7)

Understanding place and its people, reveal and enhance site's potential, creating a vision based on community's needs, conducting thorough and human-sensitive site analysis and providing site-specific solutions are critical dimensions of placemaking which all align with the idea and process of appreciation of the local context. Generally, this idea involves the integration of the placemaking project into the physical, social, functional, cultural and historical background of an urban space and its compatibility with the existing local activities, forms and urban dynamics.

c) **Adaptability and flexibility of spaces** (principles 4, 9, 10,11).

Adaptability and flexibility of spaces is a fundamental idea in the process of placemaking as it allows spaces to evolve and respond to the constantly changing needs of people, community and the built environment (Turan, 2016). These qualities provide design schemes with the capacity to adjust while also being use in multiple

ways without significantly changing their main structure. Adaptable and flexible urban spaces are key in sustainable placemaking projects as they encourage their spatial and functional reorganization in order to easily attain new conditions, solve social challenges and respond to space requests (Sanei et al., 2018)

2.4.2 Adaptive Urban Spaces and People-Centred Urbanism

Since cities act like living organisms their constant change is inevitable. As a result, new forms of urban initiatives and experimental practices have been developed lately in the field of placemaking aiming to address the lack of contextualization of typical top-town processes in planning by offering more adaptive, flexible and dynamic solutions to the design of public space (Bishop and Williams 2012). Adaptive urban spaces can be mainly considered socially sensitive spaces as they aim to adapt to the changing needs of the local society being more inviting to the new users and, most importantly, to the effects that these users may cause to the environment (Turan, 2016). Gehl (1987) highlights the importance of the feature of space invitation noting that an inviting urban environment is a setting were citizens can gather, communicate face-to-face and experience it directly with their senses. For Lang (1987) this form of *welcoming* space is a social space that is also characterized by human scale and a diversity of behaviours and activities as well as a general feeling of acceptance.

Flexible and adaptive public space, as a result, give its users more opportunities for socialization. Furthermore, adaptive urban environments give the opportunity to the citizens to participate in the process of transformation of their urban environment opening up the possibility for community engagement and the promotion of healthier, connected and sustainable communities (PPS, 2008) especially when accommodating projects with experimental and temporary nature. These tactical strategies integrating practices of architecture, urban design and landscape design can have powerful impact on the everyday space, the physical setting of everyday personal and public activity of the citizens (Bonnett, 1992), while also standing up against formal and insensitive to human experience design processes (Chase, Crawford, and Kaliski 2009).

According to Lydon and Garcia (2015: 2) tactical urbanism is “an approach to neighbourhood building and activation using short-term, low-cost, and scalable interventions and policies”. This type of approaches directly derive from the physical and social context and they aim to address needs of the local community by offering low-cost and flexible solutions. Tactical interventions are often a stage for dynamic

experimentation in the space left over the standardization of public realm and, as Bishop and Williams (2012) note, while some of these actions are formally planned some others are spontaneous, informal or even illegal.

a. Animating public space through tactical interventions

Some of the most successful placemaking projects have emerged from this type of flexible adaptations of public space, also known as "do-it-yourself" (DIY) urbanism (Douglas, 2014; Iveson, 2013; Sawhney, de Klerk, & Malhotra, 2015; Talen, 2015), "pop-up" interventions (Beekmans & de Boer, 2014; Lashua, 2013, 2015), "urban hacking" (Spencer, 2016) or "guerrilla urbanism" (Szibbo, 2012). These forms of urban interventions fall under the wider and more inclusive scope of public animation (Glover, 2015) which refers to "the deliberate, usually temporary, employment of festivals, events, programmed activities, or pop-up leisure to transform, enliven, and/or alter public spaces and stage urban life" (p. 96). Models of public space animation, therefore, may include "pop-up" parks, chair bombing and flexible urban furniture, community gardens, street markets as well as public art and interactive installations. Whatever the model implemented, all these temporary low-scale animation practices are often led by the local community, stakeholders and the citizens themselves and aim to establish a new kind of urban experience (Hou, 2010; Iveson, 2013; Lefebvre, 1996). **This type of approach to the notion of the city and urban space configuration aligns with what Lefebvre (1991) considered as "social production of space" where the citizens can be the producers of a bottom-up city as opposed to the top-down view that characterizes traditional urban planning.**

As a form of placemaking, attempts to animate public realm through flexible reconfigurations of space, concentrate on the specific qualities of place itself, its socio-cultural dimensions and the respective relations arising through individuals and community within that setting (Glover, 2018). Therefore, the notion of animation goes beyond the aspects of mere geographic location and spatial form involving the ideas of (re)interpretation, (re)imagination, (re)definition and narration of place to inscribe public space with value and meaningful experience (Gieryn, 2000). In this regard, public space animation identifies, values and enhances several aspects of urban experience in a neighbourhood or a city. As a result the way public space is animated may offer a rich understanding of people's needs, human experience, community values and place attachments within each urban setting (Brandenburg & Carroll, 1995; Glover, 2015).

At a community level, according to PPS (2012) by embracing such practices cities are able to redefine their public spaces and transform them into “exciting laboratories that reward citizens with authentic places” (p.15). The diversity of activities and enhanced vitality of space associated with animation attracts more attention to public realm and encourages community members to collaborate towards common goals. Furthermore, these people-centred initiatives can be used either to re-activate existing public space or to create a new one at poorly designed or left-over areas that have resulted from planning limitations, providing new ‘creative escapes’ (Lévesque 2013), maximizing the amount of public space in the city and forming new places for social activities (Rossini, 2019)

b. Creativity and art

> *“Placemaking is a process, accessible to anyone, that allows peoples' creativity to emerge. When it is open and inclusive, this process can be extraordinarily effective in making people feel attached to the places where they live.”*

Project for Public Spaces, 2013

In recent years, there has been an emerging interest in the role of culture and creative activities in people’s lives, community connectedness and city’s performance. There is now a clearly acknowledged relation between the social and economic development of an urban environment and the respective value of the cultural and creative sector (LGA, 2017). Particularly, culture and creative activities refer to “all sectors whose activities are based on cultural values, or other artistic individual or collective creative expressions” (European Commission, 2018). Besides, its contribution in economic growth and social cohesion, cultural and creative activity as an enriching experience has been acknowledged to promote citizens’ physical and mental health as well as education. As a result, one of the most important changes that have taken place lately in placemaking activity has been the emergence of creative and cultural “modifier” (PPS, 2013). Artistic placemaking activities based on various forms of art and creative expression are now incorporated into several urban revitalization projects aiming to increase the awareness of the significance of public space and the role of art in improving the quality of public realm, while placing artists in the centre of the placemaking process (Omar et al., 2016). Local Govern Association (2017) in their report on the role of culture in placemaking emphasize that arts, culture and heritage can help the reactivation of public space and foster the unique cultural and urban identity of the city by strengthening its distinctive assets

and potential. Furthermore, the enhancement of cultural identity can have a positive effect on individual's sense of engagement with space as well as their feeling of belonging, appreciation and understanding of it (DCMS, 2016).

Particularly, the role of public art as part of a city's cultural agenda can be vital in the establishment of social and cultural identities or even in the transformation of the entire meaning of public space. That is because this form of art by nature is not solely concerned with aesthetics but, by being located within public space, it is directly contextualized. Consequently, it can refer to or be influenced by the respective social, cultural, or political setting.

Public art, according to Public Art Southwest of the United Kingdom, is refers *"to artists and craftspeople working within the built, natural, urban or rural environment. It aims to integrate artists' and crafts people's skills, vision and creative abilities into the whole process of creating new spaces and regenerating old ones, in order to imbue the development with a unique quality and to enliven and animate the space by creating a visually stimulating environment"* (Hui, 2003: 73)

From a social phenomenological perspective, a piece of public art, defines and is defined by its physical context and forms a part of wide social environment. Proshansky et al. (1983: 3) note that "the processes through which a person defines theirselves in a society are not restricted to making distinctions between oneself and significant others, but extends with no less importance to objects and things, and the very spaces and places in which they are found." This is not only related to the micro-environment where an artwork is specifically located, rather it refers to qualities and identities created for entire cities (Sandle, 2000). For W. Whyte (1980) artworks placed in public space, sculptures for example, can have very profound social effects and positive impact on pedestrian activity as "…people are drawn to the sculpture and drawn through it: they stand under it, beside it; they touch it; they talk about it." (p.96). He notes that street performances such as musicians and entertainers have similar effects as they provide opportunities for triangulation and the *amphitheatre effect*. The latter refers to the phenomenon where people when watching a outdoor performance are very often looking a each other as much as they watch what happens at the performance.

Since the 1970s and especially following the civil rights movement's claims on public space, public art has gained a meaning that goes beyond the history memorialization or pure decoration of urban realm (Krauss, 1979, Knight, 2008). In that context, public art was gradually converted into a form of intervention or even space construction for

public interests (Goodey 1994; Hall, 1995; Hall, 2003, Hall & Smith, 2005). The separation between the previous traditional forms of public art and the later more contextualized artistic expressions in public space became clearer during the 1990's when new alternative terms emerged to characterize those practices such as contextual art, relational art, participatory art, dialogic art, community-based art, activist art or "new genre public art".

American social practice artist Suzanne Lacy defines *new genre public art* as "socially engaged, interactive art for diverse audiences with connections to identity politics and social activism". In this form or art artists seek to precisely support marginalized groups through their activity instead of metaphorically touch on social issues, but maintaining at the same time their aesthetic quality. This approach of *social intervention,* however, can be also partially identified in the 1960s and 1970s in the artist movement of Situationist International who challenged dominating beliefs on everyday life, society and its institutions (Krause, 2008).

Placemaking, contemporary urbanism and public art share common tenets, as they are all mainly based on the idea that the physical environment and the way people perceive it, can highly affect both people's experience in space as well as the sense of community. Through the incorporation of pre-modernist design principles into new urban schemes, placemakers aim to increase opportunistic and face-to-face social interaction and enhance people's sense of place through targeted creative interventions in public space (Grant 2006; Katz 1994; Krieger 2009).

2.5 Conclusion

The review of the literature on place, place experience and placemaking provides three significant insights. First, the nature of place and consequently place experience in the city is a rather complex and versatile idea that needs to be studied and interpreted through various perspectives to get a thorough investigation. Secondly, the value of creating distinctive place experiences in contemporary urban environments is critical due to the various urban challenges that threaten the configuration and performance of public space. And third, public space can act as a stage for creative transformations with serious implications on people's everyday lives as it consists of constantly permeable nodes for action and citizen's participation. In that sense, placemaking can promote better quality of life in the city by enhancing an area's potential through physical and social transformations.

Placemaking can restore the vital place experience in public space which in a lot of cases is getting lost due to the constant transformations in urban and social level in several parts of or even entire cities. In that context, placemaking interventions and particularly the ones with a flexible and creative character can promote positive individual and collective experiences by developing new structures and uses that can create a new layer activity and image in the city.

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CHAPTER 3

Shaping place experiences through media interventions in public space

The built environment and especially public space are the settings where each city's culture is developed and conveyed; through their configuration, activities and norms, human experience and interaction are formed, expressed and reproduced (Hillier & Hanson, 1984). There is a range of perspectives as to how positive urban experience can be shaped through public space; Through exposure to strangers and opportunistic encounters (Arendt, 1999), through interaction and socialization with other people (Habermas, 1999) or through contact to high level of diversity (Sennett, 1977). The space within these conditions occur is significant regarding the level to which and how it provides a platform for such publics to perform. In that context, the role of (situated) digital technology can be crucial as it has the potential to reframe face-to-face interaction (Willis, 2016) but at the same time introduce users to a much more diverse set of spatial, social and perceptual stimuli. From that perspective, the introduction of physical digital features into an urban environment can promote new ways of experiencing public space by establishing new types of relations between people and the physical environment as well as novel approaches to human encounters and social interaction between users (Briones et al., 2005). The following chapter is therefore going to assess the role of digital interventions in contemporary public space and explore their experiential qualities.

3.1 Digital Element in the City: A new material or opportunity for placemaking?

In recent years, digital media have seen an increase in their physical presence in the city and consequently in the embodied experiences they provide (Dourish, 2001). This is due to the fact that digital technology is more prevalent in the built environment, both in urban and architectural scale, often encouraging users to understand space as dynamic and adaptive forms that respond to the surrounding context. In this regard, the role of digital element in contemporary public space seems to be twofold; to provide a novel and dynamic construction material as well as to develop a new adaptive, responsive and highly experiential layer in the city.

3.1.1 Types and Key Features Of Digital Interventions In The Urban Context

Fischer and Hornecker (2012) in their study on urban human-computer interaction and the design of interactive applications use the term digital interventions to describe all the physical installations that use digital technology to **"intervene in public spaces, changing their nature and use ephemerally" (p.2).** Furthermore, they state that the nature of these interventions is not necessarily permanent as the term installation might suggest. This statement aligns with the perspective of this PhD study, therefore the term **digital/ media interventions will be also adopted**. However, the term intervention will be frequently used interchangeably with the **term *installation* when referring to particular morphological or technical features of these applications. Furthermore, the term *interactive* will also be used to denote 'two-way flow of information between user and installation' (languages.oup.com) for those capable of responding user's input. Finally, drawing on the fundamental scope of this study the terms 'public space' and 'urban space' will both refer to the context of a city's public realm.**

Digital interventions in public space regardless whether they constitute outcomes of media architecture, media art or digital placemaking have been classified variously according different aspects of their own nature or relationship with the surrounding context.

Spatial Classification

Tscherteu and Tomitsch (2011) developed a spatial classification of urban digital interventions according to their level of integration with the existing urban fabric or building. In that sense, they identify three main types of interventions; a. Urban

Screens, b.Media Facades and c. Interactive digital installations or media installations.

Urban screens refer usually to large- scale interventions including screens being attached to a building's façade without necessarily creating any dialogue with it. As a result, screen and building can be considered technically as two separate parts with each part communicating with the users individually. Furthermore, urban screens are identified in the urban context as standalone independent structures with communication reasons as their main purpose (Tscherteu and Tomitsch, 2011). *Media Facades* indicate a closer relationship between the digital and the built feature of the building, if not a complete incorporation into a new hybrid construction. This type of façade mostly consists of lighting components, kinetic features and a network system for data assessment. Although technically the image generation occurs in certain parts of the façade, this is interdependent for the overall understanding of the building. The observer perceives single pixels (parts of the façade) as merged in one large image (ibid). *Interactive digital installations* or media installations are three dimensional interventions placed in public space, which show a clear differentiation of the two dimensional concept of a screen or façade (Tscherteu and Tomitsch, 2010).

Scope and use

Hespanhol et al. (2017) in their seminal book *Media Architecture Compedium: Digital Placemaking* classify digital interventions according to their key scope, function and use. In that context, they identify five main types: Animated architecture, money architecture, Participatory Architecture and Urban Interaction, Spatial media art and Future trends and Prototypes.

Particularly, projects of Animated Architecture incorporate media into the physical form of the structure, usually as media facades. Although a media feature appears on the frontage(s), the overall design of the building remains the main focus of the structure. Dynamic digital components are applied in purpose- not to undermine the initial architectural form of the building but to reinterpret in in more contemporary terms. Ultimately, the fundamental scope of Animated Architecture is not make the building the carrier of innovative digital technology, rather than the building itself to become the direct medium of this media technology (Hespanhol et al., 2017). Money architecture represents the interpretation of economical status through the appearance of the building and is mainly identified in three cases: shopping malls, casinos and banks or insurance companies (ibid). Participatory architecture refers to digital projects with interactive interfaces that promote the interaction between the

user and the installation or the building and therefore the users of the city (ibid) (fig. 3.1). Spatial media art regards the type of digital often experimental art applied in the urban environment. According to the researchers, this type encourages a playful and exploratory use of digital aesthetics and technology leading to impressive results and raising significant inspiration for other fields of media architecture. Therefore, they consider type as an empirical "playground" for digital place- making where new forms of social and cultural ideas could be investigated (ibid). Finally, Future Trends and Prototypes, include custom-developed installations like kinetic facades and three dimensional digital artefacts which use LED technology, implying how the process of place-making might be like in the future (ibid).

Furthermore, Aurigi (2013) in an attempt to identify the main areas of augmentation of urban space through the application of digital technologies and ubiquitous computing, he notes three key areas that also play an integral role in urban design; a. scale and sense of place, b. the social aspects of place – especially the articulation of public and private; and c. the functional dimension of how urban spaces can be used, or what uses they can support.

Digital interventions as Ambient media in the city and their main drivers

Wierzbicki et al. (2010) use the term "ambient media" and "interactive ambient interfaces" to describe outdoor digital installations mainly used for marketing reasons as well as for human interaction. Specifically, they indicate the following types of interventions:

a) Ambient intelligence projects- which address the improvement of people's everyday life through the application of wireless sytems, computer networks and sensors

b) Ambient marketing/ advertising installations- which use ambient media as communication channels for commercial reasons

c) Ambient entertainment installations- which transform the medium's physical context into a stage for entertainment and new experiences.

Digital interventions in architecture

Gasparini (2013) in her research study *Media architecture: origin, synonyms and interpretations* which focuses mainly on the interpretation of digital interventions at an architectural level from a spatio-phenomenological perspective, establishes seven different types. The first is video walls and projections and regarding this type Cargioli

(2002) interestingly notes that sometimes in video installations "the attention is focussed on the images in the monitors or screens; other times they resemble an entire space and the connections between the images and the other subjects become more sensitive, capable of reacting to visitors' inputs, creating possibilities of dialogue, above all with interactive installations" (p.27). The second type is the Urban Screen, which has also been explained before. Third type constitutes the Light Architecture which refers to the application of an artificial lighting system on a façade or entire building. The fourth type is Blurring Architecture a term coined by the famous architect Toyo Ito in 1999 encompassing *"an architecture with soft and diffused borders as a consequence of the overlapping and blending of the built space with the natural environment"* (Longobardi and Ito, 2003: 51). The fifth type concerns the concept of Hypersurfaces and Transarchitecture which explores the innovative contemporary architecture state in which the form can be detached from its main use and the project is released from the surrounding context. In other words it represent the outcome of "of endless relations between shape and image" (Gasparini, 2013: 5). The sixth type related to Interactive architecture which refers to the type of objects and space which can transform in order to meet the changing need of the context through the use of kinetic and digital features, while the seventh type is the one of Responsive Architecture, which includes projects that adapt their physical components according to measurements of actual environmental conditions.

Fig. 3.1 I AM interactive façade by Guto Requena, Sao Paolo, Brasil (https://www.archdaily.com.br/)

Digital Interventions	Types	Key Factor	Perspective	Reference
C1	a. Urban Screens, b. Media Facades c. Media installations	Level of integration to the building or urban fabric	Spatial	Tscherteu and Tomitsch, 2011
C2	a. Animated architecture, b. Money architecture, c. Participatory Architecture and Urban Interaction, d. Spatial media art , e. Future trends and Prototypes	Scope and use	Design	Hespanhol et al., 2017
C3	a. scale and sense of place, b. the social aspects of place – especially the articulation of public and private; and c. the functional dimension	Urban space augmentation	Urban design	Aurigi, 2013
C4	a. Ambient intelligence b. Ambient marketing/ advertising installations c. Ambient entertainment installations	Marketing reasons and human interaction	Marketing	Wierzbicki et al., 2010)
C5	a. Video wall b. Urban screen c. Light architecture d. Blurring architecture e. Hypersurfaces and Transarchitecture f. Interactive architecture g. Responsive architecture	Form, performance and experience	Spation-phenomenological	Gasparini , 2013

Table 3.1 Existing classifications and types of Media Architecture and situated digital technologies

3.1.2 A New Classification

Digital technologies can variously transform or augment the urban environment, and it is beyond the scope of this study to attempt to make any comprehensive list or taxonomy of their affordances. However, at a conceptual level, through reviewing, analysing and re-synthesising the key characteristics of all the aforementioned types and approaches to digital interventions (table 3.1), two major set of characteristics have been identified. These sets essentially reflect the two areas between common debates within urban design and planning discourses occur (see for instance Healey, 1996; Pissourios, 2014) and could be also largely related to top-down in contrast to bottom-up design approaches. However, as Aurigi (2013) notes, the digital augmentation of the key urban design and planning areas may lead to quite different outcomes in regards with urban experience, or 'cityness' (p.7) due to the complexity and versatility in the perception of the urban context, creating new opportunities and issues.

As indicated in the table below the two main set of characteristics include the functional/ technical ones and experiential/ place-related ones:

Functional- Technical qualities	Experiential- Place-based/ people-centred qualities
▪ Digital screens for message communication (C1,C2,C3, C5) ▪ Digital projects for marketing and advertising (C1,C2, C3, C5) ▪ Buildings as carriers of innovative technology (C2,C5) ▪ Dynamic digital building components conveying economical status by forming a sophisticated building appearance (C2, C3) ▪ Intelligent/ smart projects (C4)	▪ Digital interventions as interfaces that promote human interaction (C2,C4) ▪ Experimentation through arts and crafts (C2) ▪ Playful and exploratory use of digital aesthetics (C2, C3, C5) ▪ "empirical playground" and digital placemaking (C2, C3) ▪ Entertainment and new experiences (C4) ▪ Sensitive interventions reacting to user's input (C5) ▪ Able to transform and adapt to the changing context (C3, C5)

Table 3.2 A new classification of Media Architecture

Digital interventions as infrastructure and Digital interventions creating place experience

From an urban design perspective, digital interventions as infrastructure could contribute to the development of memorable landmarks for navigation and identification, referring here to Kevin Lynch's (1960) 'image of the city'. Furthermore, as Struppek (2006) notices, all types of situated urban digital technologies can assist the creation of local memories as long as a distinctive and rich culture can be promoted and maintained through these interventions.

However, since the key aim of this study is to explore the affordances of situated digital technologies in the urban experience and place attributes, main focus will be given to the exploration and understanding of the second category (digital interventions creating place experience), as it reasonably establishes more interconnections and logical relations with it.

Particularly, this research proceeds along the path pursued by Stevens (2006) on his seminal research paper on the experiential re-evaluation Lynch's main elements of the city, and especially regards the notion of *Landmarks and Props*. Stevens in his study drew to attention the fact that Landmarks are critical parts of city's infrastructure as "point references" for wayfinding, they are also "external to the observer" (Lynch, 1960, page 78) because they are largely seen only from a certain distance, and "the observer does not enter into them" (Lynch, 1960, page 48). Therefore, they assist orientation, but they are not spaces of direct action and lively human experience (Stevens, 2006). *Props* on the other hand are smaller-scale identical structures which also combine meaning and use. This category may include a variety of urban objects such as public artworks, play equipment, and street furniture, or in the context of this study, digital interventions.

3.1.3 Digital Interventions as Experiential Objects

Public space is commonly identified by a city's streets and squares is recently very often transformed through the application of such digital interventions-props that undoubtedly affect its initial experiential state of the area.

Particularly on the notion of props, according to Stevens (2006: 811-812)

> *"Props are objects which have been added to public settings with the intention of making them more comfortable, by contributing to their function and aesthetics. Yet they were also observed to make possible*

> *and to stimulate a variety of non instrumental, exploratory, and risky forms of movement.[….] Though small, these are challenging physical landscapes which can be explored with the body. They are things to be jumped or avoided, or in some cases bent and modified."*

Experiential digital interventions (second type- digital props) generate opportunities for awareness and engagement of the users into the construction of publics in a mixed traditional and innovative approach to space configuration. The term *prop* is commonly used in theatre terms to refer to "an object used by the actors performing in a play or film" (https://dictionary.cambridge.org/). In a similar way, digital props may offer opportunities for bodily interaction while also affecting the typical forms of movement. The type of act with this urban form, however, is close, detailed and explicit.

This has various impacts on how the built environment functions as an accessible platform or 'stage' for individual and community urban experience and implies that interaction with media interventions also constitute an urban layer. In public space, the combination of media interventions, human interaction and physical context can create the conditions for "shared encounters" between strangers, unique sensory and emotional experiences for the users, new perceptions and interpretations of space as well as direct visual transformations.

Relevant claims have been made regarding the relationship between new urban installations described in some studies and their role in enhancing urban experience by adding a layer of interaction into place experience (O'Hara et al., 2008; Snibbe and Raffle 2009; Reeves et al., 2005; Peltonen et al., 2008; Hornecker 2008). Digital installations explored in these research papers, unlike interventions that rely purely on infrastructural changes, integrate digitally mediated human interaction "as the means to unfold the place experience" (Punnen, 2014: 41). Moreover, as Wouters et al. (2016) state, certain media architecture projects have the ability to create experience and an 'atmoshere', they can "turn non-places into places" (p.3) and even transform completely space's identity. They also point out that *this is not a pure outcome of the aesthetic experience created by the light effects, but it rather involves the transformation of the entire perceptual experience of space*.

Certainly, this convergence of digital technology, spatial forms and human interaction can provide new opportunities on how users experience public space. Punnen (2014) uses the term *Interactive Placemaking* to describe the incorporation of technology and interactivity into place experience as part of the processs of placemaking.

Ultimately, the main concept of interaction with this type of digital interventions extends from the idea of digital artifacts to everyday lively environments where digital technology is embedded to "facilitate situated, contextual, meaningful interactions" (Tan & Chow, 2018: 1)

3.2 Exploring the Affordances in Place Experience

Affordance is a term related to ecological psychology and it essentially refers to what the environment offers to the users (Gibson, 1975). In this sense, the aim of this section is to explore the experiential qualities of media art and architecture artefacts as well as to review their role in the enhancement of the contextual, social and perceptual qualities of public space. Particularly, this part of the study will reflect on various issues related to the digital augmentation of urban space looking at the versatile affordances of such interventions from various perspectives yet framed within an urban design context.

3.2.1 Contextual Dimension

As noted in Chapter 2, context is an integral aspect of place experience and it essentially refers to a physical space that has gained substance and meaning through human consciousness as well as by material interventions (Jauhiainen,2005). The following section investigates the contextual aspects of urban digital interventions- the effects of an intervention on the respective urban context, as well as the factors that influence intervention's integration in it. Considering both the material as well as the immaterial qualities of context, the primary features of the reciprocal relationship between context and installation from a socio-spatial perspective will be explored by looking, also, at the potential that these interventions provide for public space re-definition through the establishment of new dynamic socio-spatial configuration.

a) How digital technologies affect their environment

The location, size, shape, content and even the orientation of a digital intervention are crucial for the creation of powerful connection with a specific area's audience as well as to ensure visual and spatial compatibility with its physical surroundings. As Struppek (2006) points out that, in the current state of placelessness that characterizes various contemporary cities, the implementation of this type of urban interventions can be critical. Especially, according to Struppek (2002) and Tomitsch and Hespanhol (2012) media installations may help to prevent further disconnection of citizens in the perception of their urban space while also enhancing public space's liveability.

From a spatial-perceptual perspective of context, Wouters et al. (2010), in their study on the contextual characteristics of media architecture, state that urban digital interventions may transform the existing physical context by infusing it with “poetic” visual effects while also introducing a new “interesting scenography”. Especially, they point out three fundamental ways through which these interventions can enrich the physical space; a. By introducing a feeling for “theatrical presentation”, b. by encouraging placemaking, c. by providing novel and collective experiences. In that respect, collective experience is associated with the opportunity for interactivity provided by the implementation of media interventions in a particular context which may consequently the affect local *social dynamics.*[2]

As noted by Seitinger et al. (2009) media installations offer various opportunities for ubiquitous interaction in public space. Particularly, when designed in an architectural scaled size, they are able ensure high visibility in order to attract large numbers of visitors while they are also able to facilitate large audiences in the interaction zone they create. In this regard, Hespanhol and Tomitsch (2012) emphasize that ubiquitous interaction are mainly exists when the digital artefact is perceived as “blending into the surrounding environment while at the same time augmenting it” (p. 42). Moreover, Briones et al. (2005) argue, the extent to which a digital installation can increase social interaction depends on the social “atmosphere” of the location, the user profile and their cultural background and the affordances of the environment where it is located.

From a social perspective, a fundamental consequence of the implementation of a digital intervention is described as the *Honeypot Effect,* and it refers to the gradual increase in the number of people in close proximity to the installation, through their passive stimulation by observing users that start to interact with it (Brignull and Rogers, 2003; Muller et al., 2012; Wouters, 2016). Brignull and Rogers (2003) point out that the honeypot effect constitutes an affordance in the social context of a space, as people gather in the periphery of the installation without necessarily planning to interact with it in order to discover what is happening and what is expected from them. They also emphasize that even when people are not interacting, the social attributes of the opportunistic interaction are significant as they enable the creation of a vibrant and sociable 'buzz' around the installation (ibid).

[2] The term *social dynamics* refers to relationship between individual interactions and group level behaviours (Durlauf, 2001).

b) Contextual integration of the digital intervention

Integration and effectivity

The dynamic nature of place space characterized by its constant transformations and rapidly changing conditions makes it a fundamentally difficult setting to design for digital augmentation and, also, the design of an urban media installation a quite challenging task (Hespanhol et al, 2011; Gehring and Withoff, 2014). As Wouters et al. (2016)point out, while products of architecture adapt gradually to the requirements of their context, sometimes even after centuries, artefacts of media architecture allow direct and dynamic responses to the shifting needs and standards of a particular context providing solutions is various aspects of the urban environment. By implementing, for instance, a new use or activity, applying visual transformations, assisting wayfinding in the city or improving sense of safety through lighting effects at night.

People's overall perception of a digital intervention is highly affected by its level of integration into the surrounding context. Therefore, different levels of interventions allow for different interpretations and ultimate objectives. For example, a prominent and distinctive media installation, separated from the existing urban infrastructure functions as a standalone piece and therefore its surrounding space acts as a stage. This way the digital intervention adds new features and impressions in the current evaluation of space. Conversely, the more the medium is incorporated and "absorbed" into the structural and architectural elements of the context, the more it becomes pervasive and part of the entire place experience conveying similar contextual messages (Hespanhol and Tomitsch, 2012).

Vande Moere and Wouters (2012) identify three fundamental perspectives referring to the level of contextual integration of an urban media installation; a. the surrounding *environment* which forms the background of direct proximity both in terms of the physical setting as well as people and their activity, b. the *content* of the installation which refers to the way that it is used, even if it is purely implemented for aesthetical reasons, c.the *carrier* which involves physical elements of the built environment that carry out a supporting role in sustaining the medium for functional, structural or just aesthetical reasons.

Regarding the level of an intervention's physical compatibility and smooth coexistence with its surrounding, Wouters et al. (2010) note three main aspects; the volumentrical and proportional relationship with the existing buildings and structures,

the relation of installation's modularity with space's architectural rhythm and the dialogue between installation's new materiality with the existing materiality of the built environment. For them, these critical aspects determine the architectural quality of an urban digital intervention. Furthermore, Kutlu and Manav (2013) highlight that colour and light sources, such as urban digital interventions, should be a part of a comprehensive urban lighting scheme which will be based on various factors such as the area's main functions, location, identity, human flows and landscape configuration. In this sense, Mahnke (1996) emphasizes that the urban colour and lighting plan should focus on supporting the functionality of space, avoiding effects of over or under stimulation[3] and also preventing the creation of negative emotional or physiological effects

Similarly to placemaking, the process of digital placemaking requires the collection and assessment of some place-related knowledge before the decisions regarding the digital augmentation of the site. This knowledge primarily derives from a contextual analysis and is followed by reflection on the information gathered (Hespanhol et al., 2011; Aurigi, 2013). As Aurigi (2013) notes, contextual analysis is a key step before the digital enhancement of an urban environment as it may help to control and limit the amount of opportunities provided by digital technology, in terms for example of function, scale, performance and dimension. He states that, designers, by conducting a thorough contextual analysis will understand the main features of space and by that they will critically look at the technological possibilities of a digital project keeping only those that will enhance or compliment the particular place experience. From a phenomenological perspective, urban media art curator and theorist Tanya Toft (2016), building upon Kwon's ideas regarding art's integration into the social realm of everyday experience, points out that urban media art mostly reflects site-specific concerns and focuses on the creation of places for versatile experience and 'sense of place'.

Location

Schroeder et al., (2012), also, explored the effect of contextual characteristics such as the urban location, audience demographics and the type of media intervention on the level of public engagement with it. They describe as a "sweet spot" a spatial context with high levels of interaction needs to be a location that is able to facilitate the users who are interested in the content of the digital intervention, which has in

[3] Excessive or insufficient level of sensory information deriving from environmental cues affecting individual's psychological state and behaviour (Gifford, 2007)

turn been properly focused on them. On the other hand, in case these factors are not optimal, social interaction will diminish both in terms of quantity (small number of people interacting with each other) but also quality (less pleasant/appropriate or shorter in duration interactions).

c) Redefining public space socio-spatially through the application of digital interventions

Fischer and Hornecker (2012) building on Goffman's (1963) theory on Shared Encounters which integrates the fields of architecture, urbanism, social sciences and anthropology, analysed the spatial configuration of urban digital interventions based on the structure of human interaction and performance. Particularly, through their reflection on the work of Edward Hall (1966) on *proxemics*, Adam Kendon's (2009) on the spatial analysis of human interaction and William Whyte's understanding of public space they sought to explore and describe human interaction with digital systems in public space.

The researchers designed and deployed two digital interventions, Spread.gun and SMSlingshot (fig. 3.2; 3.3; 3.5; 3.6) at various locations and contexts and explored the "values" and potentials they created for the respective public spaces. Regarding the key concept of first intervention, Spread.gun, the researchers point out that they sought to create through their intervention an "ancient Greek agora" (ibid:308) feeling in public space by giving people the opportunity to intervene to the content demonstrated in public space and to modify existing screens. SMSlingshot intervention follows similar principles but it also embeds the quality of embodied interaction through expressive gestures (http://theconstitute.org/the-smslingshot/).

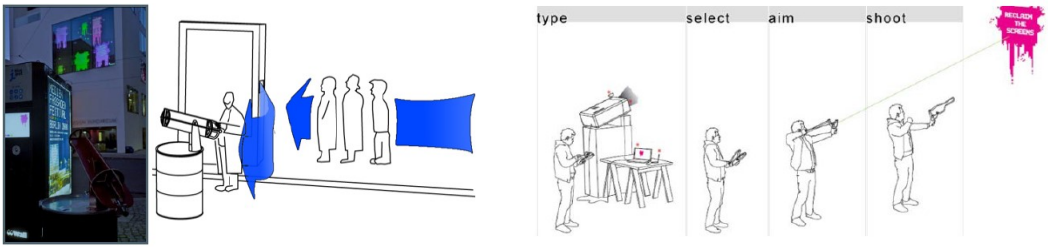


Fig.3.2(left) The Spread.gun setup and its process of spatial use (Fischer and Hornecker, 2012)
Fig 3.3 (right) Interaction with SMSlingshot (Fischer and Hornecker, 2012)

They note that by exhibiting the installations in a variety of spaces for a period of three years, the role of the actual spatial setup was revealed as well as the effects of scale in the success of an intervention. Developing on Whyte's approach, they examined the performance of their urban interventions based on the roles of performer, participant and observer. Finally, they identified seven types of sub-spaces that are

formed within a certain public space (they used a plaza as an example) during the application of an interactive intervention. The size and position of sub-spaces depends on the type and context (physical and social) of the installation. Furthermore, the sub-spaces are also dynamic meaning that they can also change size throughout the time of intervention, or they can even overlap (Fischer and Hornecker, 2012).

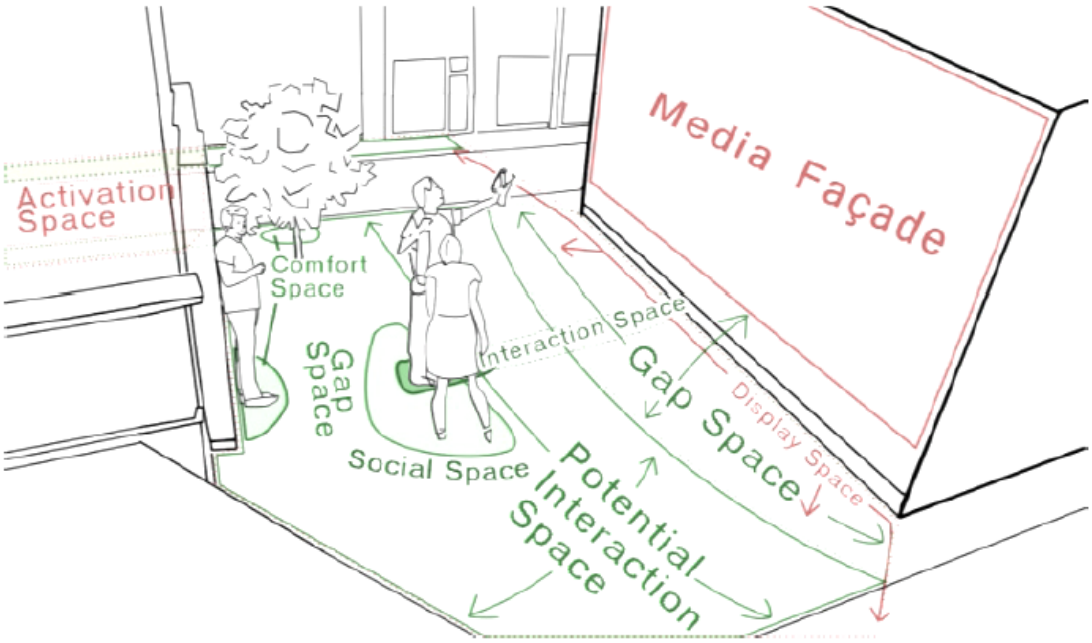


Fig. 3.4 Types of sub-spaces created within public space during the presence of a media intervention (Fischer and Hornecker, 2012)

The identified sub-spaces are (fig. 3.4):

Display Spaces: Areas with visual contact with the installation

Interaction Space: Areas where main engagement with the installation takes place

Potential Interaction Spaces (PIS) Areas where engagement with installation can potentially take place

Gap Spaces: Areas without interaction either between people or between people and the installation

Social Interaction Spaces (SIS): Spaces where people gather and create shared encounters are being attracted by the installation

Comfort Spaces: Areas that promote a sense of spatial and psychological comfort and enclosure like walls, edges or trees where people are subconsciously drawn towards

Activation Spaces Areas where installation is visible, usually causing curiosity but where direct engagement with the installation cannot take place.


Fig. 3.5, 3.6 Examples of interaction with SMSlingshot installation by VR/ URBAN (http://theconstitute.org/the-smslingshot/)

3.2.2 Social Dimension

As seen in the previous section, urban digital installations can strongly affect not only the physical but also the social context of their location. Urban spaces are areas where citizens spend considerable amount of time and, therefore, the introduction of a new digital and interactive layer enables new modes of interaction between people as well as between people and their environment. As a result, digital augmentation of public space can lead to its social mediation at multiple levels and in different ways.

a) A new form of social experience

Although digital technology has often been accused of weakening social contacts and even in some cases challenging quality of life (see Chapter 2 and 3.2.1), today's urban digital interventions, especially the one that deploy media art, are increasing being recognized as catalysts of positive spatial and social transformations. Despite their technologically advanced nature, contemporary forms of urban media interventions can contribute to the creation of various kinds of social encounters. As a result, such digital artefacts can lead to the creation of lively public spaces where citizens have the opportunity to interact with the installation itself, or with each other or even just passively engage with space by observing the installation and other people's interactive experience (Urbanowicz and Nyka, 2016).

The design of interactive models and structures that promote user's participation and situatedness has been a common concern in HCI research. Already in the 1990's, Ishii and Ulmer (1997) emphasized the crucial change in interactive experiences from typical graphical interfaces to gradually more participatory, pervasive and tangible experiences.

From a conceptual perspective, Haque (2006) noted that interaction as a process involves the exchange of information between a person and the digital artefact. For him, these transactions should be reciprocal and therefore result in a 'multiple-loop'

interactive experience, depending on 'conversational creativity' of both the user and the artefact. This can be associated with the notion of *shared encounter*, which has been also defined by Willis et al., (2010:4) more broadly *as*

> *"the interaction between two people or within a group where a sense of performative co-presence is experienced, and which is characterized by a mutual recognition of spatial or social proximity"*

At the same time, the spatial context has a key role in the formation and reflection of social behaviors and interaction patterns. This is evident in the way it contributes to space creation (Hillier and Hanson 1984). In this sense, space not only indicates existing social patterns but it can also generate these patterns, offering a stage for various human encounters (Fatah et al., 2010). McQuire (2006) in his article "The politics of public space in media city" suggests that ,in a city free from stable forms and dimensions, a new model of social experience emerges as a constituent of the spatio-temporal regime of the "mediatized production of urban space" (para 12), which calls it *relational space.* For him, the diversity of this form of social experience is critical in the context of contemporary globalization and requires "new ways of thinking how we might share space to constitute collective experience" (para 12). Furthermore, in the book The Media City: Media, Architecture and Urban Space that followed in 2008, McQuire notes that experimental digital practices, especially in the field of contemporary media art can provide a powerful "test-bed" for the critical exploration of relational space by encouraging new forms of public activities.

Recently, various experiments and creative novel concepts regarding the implementation of urban media art and interactive interventions have been deployed and assessed in public spaces globally, indicating very frequently surprisingly positive outcomes in terms of public space reactivation (Urbanowicz and Nyka,2016).

b) Triangulation and new forms of human encounters

Initiating social interaction

As mentioned before, one of the key principles of placemaking is Triangulation. This process is highly important for the performance of public space as it can bring people and particularly strangers closer. Certain stimuli from the surrounding environment can lead to triangulation as they are able to initiate human interaction in space. Moreover, according to Whyte (1980) environmental stimuli that trigger conversations between strangers are often street performances, shared activities or public artworks. This kind of behavior has been also noticed between museum users in the presence of landmark exhibits (Vaz et al., 2018).

In the context of digitally augmented public space, digital intervention is the stimulus which triggers people's attraction to stay in the respective public realm, to engage and play with the installation and also to create spontaneous social encounters. As a result, all users that are present at the particular urban setting will be performing different levels of activity creating a vibrant "social spectacle" (Urbanowicz and Nyka,2016: 593). Hespanhol and Tomitsch (2012) also identified similar implications in public space through their action research study that involved the design, application and assessment of two media displays located in public spaces of Sydney. From their observations they concluded that the digital interventions were highly effective in transforming the sites from spaces used mainly for transition to spaces that provide a collective, interactive and joyful experience without disrupting at the same time people's flows. Furthermore, Gehring and Wiethoff (2013) through also developing, deploying and assessing a digital prototype in public space of in Linz, Austria, noticed that people regardless their familiarity to digital technology and media installations were willing to interact both with the installation and with each other, stimulated by their contact with the installation.

Hespanhol et al. (2011) use the term *elastic experience* and *elastic engagement* to describe the phenomenon of the evolving interaction, which starts from the individual engagement with an installation to the collective interaction with and through it. They also associate the setting of the changing dynamic interaction with the framework often used to examine the level of engagement with an artwork compared to the level of engagement with an architectural project; the first involves more an individual absorption by the object while the second involves a form of collective absorption by the building (Benjamin, 1970).

Lozano-Hemmer (2002: 2,3) describing the concept of his artwork Body Movies provides a very interesting perspective on how the integration of interactive technology into public space can trigger social connection and provide opportunities for new types of collective experiences:

> *"My work is best situated somewhere between architecture and the performing arts.* ***For me it is a priority to create social experiences rather than to generate collectible objects. The making of a piece itself is closer to developing a performance or a play than a visual artwork...*** *You have this frame and you step back from the subject, from reality, as though looking through this neutral glass…[In my work]* ***spectators play an active role, not a passive one.*** *People who are participating are in fact reflecting. People are not innocent when they activate interactive works in a public space, and this already constitutes*

a certain ground for reflection. People are participating in these sort of interactive operations with a lot of knowledge and awareness."

New digital Encounters

Following the process of triangulation, digital interventions have then the potential to form human encounters by engaging them into participatory activities. Various studies have found that examples of media art (Fischer and Hornecker, 2012; Struppek, 2012), interactive installations (Briones et al., 2007) and responsive interventions (Adriaansens and Brouwer, 2002) can trigger multiple forms of interactions and social relations as well as create shared encounters (Willis et al., 2010; Urbanowicz, 2012). Fatah gen Schieck et al. (2010) use the term *digital encounter* to describe any form of *"ephemeral form of communication and interaction augmented by technology"* (p.180). Through their study, which focused on this type of encounters, they show that by establishing a digital surface and by introducing a transformation in a particular area within urban space, people pay more attention to other people around them. Furthermore, people's behavior changes as the researchers also observed effects on the way people communicated with others becoming more willing to form spontaneous encounters.

In a similar sense, Hespanhol et al. (2011) in their work *Elastic Experiences: Designing Adaptive Interaction for Individuals and Crowds in the Public Space,* explore the concept of familiar strangers in the context of interactive art installations. This concept was introduced by Milgram (1977) and refers to people we come across regularly and recognize, yet we do not personally know. In their study, they found that the density and intensity of the human encounters was proportional to the size of the total audience interacting with the installation. In other words, the more the space was occupied by people the more they engaged into conversations with strangers.

c) Types of Interaction and Interaction Patterns

Digital interventions can broaden the urban landscape by converting public spaces into animated interactive areas where people converge for fun, dialogue or reflection. Furthermore, the dynamic nature of experience with media interventions along with the fluid nature of public space leads to various forms and levels of interaction within respective human encounters. In the context of urban media art environments, Innocent (2016) points out that there are various different tangible forms of interaction between individuals which may span across several layers of public space and life; micro and macro, immense and intimate, individual and collective, short-term and long-term, public and personal.

V-Shaped and Triangular- Shaped Interaction

The two key types of interaction with a digital intervention, which also imply the level of user's interaction with other users, are the *V-shaped interaction and Triangular interaction*, as they ultimately refer to individual versus shared engagement.

Generally, crowd dynamics change according to the spatial context and object of attention (Brown et al., 2009). As a result, when limited number of people is involved into the digital experience, their main focus is concentrated on their individual engagement with the installation rather than on the other users around them.

Hespanhol et al. (2011) also confirm the aforementioned patterns of engagement through their observations with their multisensory interactive installation *Liquid Light.* Particularly, they found that, when only few people occupied the interaction zone, users realized the presence of others only through the digital expression of their engagement with the installation, their avatars; with that being a typical V-Shaped interaction model (fig. 3.7) . However, when the number of users into the interaction zone increased, people begun to observe other users and frequently form encounters and engage into conversations in a more triangular model of interaction (fig. 3.7).

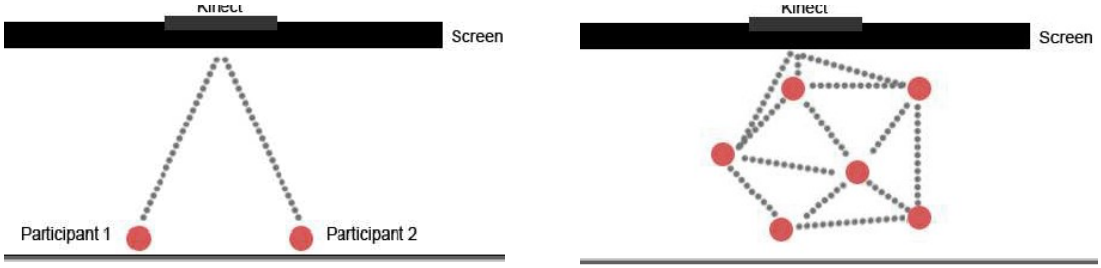


Fig. 3.7 V-shaped and Triangular shaped interaction with media installations (Hespanhol et al., 2011)

Types of interaction with digital intervention

In the same context, regarding the types of interaction during the (passive and/or active) engagement with digital interventions, Brynskov et al. (2009) identify six recurrent patterns in relation to the social interaction modes during the use of the installation; basic exploration, visual engagement, embodied engagement, narrative and empathetic engagement, showing off/, hacking/ unintended use (table 3.3).

Initiation	Interaction Style	Relation
Pass and notice	Basic exploration	Individual
Pass and interact	Visual engagement	Group
Walk-up-and-use	Embodied engagement	Family
Watch and join	Narrative and empathetic engagement	Social
Watch and take over	Showing off	
Return	Hacking/ unintended use	

Table 3.3 Initiation types of engagement with media installation and interaction styles as identified by Brynskov et al., 2009

Furthermore, the researchers in an effort to further analyze and generalized their interaction patterns, particularly from the perspective of social interaction, developed the Situational Interaction Flexibility (SIF) framework. This framework builds on Goffman's (1963) theory of human behavior in public space, which involves the ideas of occasion, situation, and encounters. According to this theory, if public space can be seen as a social space or a 'situation' that gives the opportunity for people to gather, an 'occasion' would be the stimulus that motivates people to gather, while 'encounter' constitutes the set of dynamic interactions and activities enabled by the two. Correspondingly, the framework developed by Brynskov et al. (2009) identifies four social patterns with evolving level of interaction, starting from no interaction (distributed attention) to shared focus, dialogue and finally collective action (see also table 3.4).

Level	Scope	Example
Distributed attention	Each person is in a separate 'bubble' of attention	People passing by
Shared focus	People observing the same thing, not unlike broadcast media	Watching, exploring together
Dialogue	'shared activity in which people are investing themselves and their opinions'	Showing off, intensive explorations
Collective action	People engage and work towards a shared goal	Choreography, mass explorations, hacking/ unintended use

Table 3.4 Social patterns representing levels and scope of interaction with urban media installation as identified by Brynskov et al., 2009

In terms of the nature of interactions, Tomitsch (2016) identifies six fundamental actions that people can perform during their engagement with a digital intervention which also reflects the level and quality with their interaction with others. These actions include collective playing, dancing, group performance, contemplating, solo performance and teaching as seen in the diagram below:

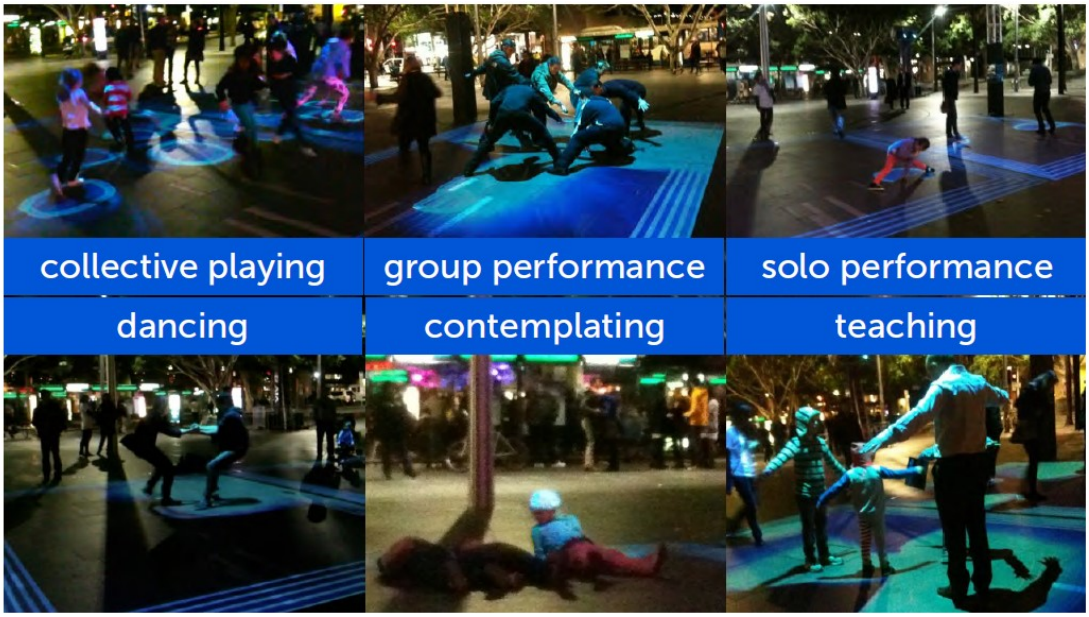


Fig. 3.8 Actions associated with interaction with digital installations (Tomitsch, 2016)

3.2.3 Perceptual Dimension

The implementation of media technology in art and architecture people's influences perception of space (Urbanowicz & Nyka, 2016b) as well as their feelings and behaviour in them. From a psychological perspective, sensation and perception are the first levels of human interaction with the physical environment, prior to thoughts and actions (Marr, 1982). Sensation involves the process of understanding the environment through senses, while perception refers to the organizations and processing of this sensory information as an integrated whole (Schiffman, 1990). In the context of urban design, Carmona et al. (2010) identify three major dimensions of human perceptual experience in the city; a. Affective, b. Interpretative, and c. Cognitive. Building upon this framework, the following section will review the affordances of digital interventions in the aforementioned areas, adding also the dimensions of sensory and bodily engagement.

a)Affective Qualities

Involve our feelings, which influence perception of the environment. Equally, perception of the environment influences our feelings (Carmona et al., 2003)

Complexity, Art and "Friendliness" of space

Visual complexity of an urban environment derives from the combination of multiple aspects such building forms, design details, urban equipment, textural elements of landscape, signage, human activity, sunlight patterns and more (Boeing, 2018). These aspects, comprising sources of sensory information for the user, can augment space experience and thus make the urban setting more liveable and dynamic. Particularly, according to Hillier (2007) when spatial complexity is high then respectively the perceptual experience of space is strong especially when it integrates multisensory information.

Psychologist and Neuroscientist Collin Ellard (2015), in his article *The Psychological Value of Public Art* sought to explore how art can enhance urban complexity and space perception. To do that, he conducted a simple experiment at an empty, former industrial contaminated lot which the city decided to decorate in order to improve its visual image. Particularly, the researcher examined the effect of public art applied onto the lot's surrounding fence in terms of how people think, feel and move around the space. He concludes that *art installations are a lot more than aesthetic interventions and decoration; when designed and located properly they can fundamentally enhance citizen's affective experience in the city and influence the way they feel and think*.

The psychology of Interaction

Although the attractiveness of a particular urban environment may be experienced, to a certain extent, subjectively; A high level of passive and active engagement with it as well as the social interaction with other people within it increase the sense of comfort and security (Carr et al., 1991; Struppek, 2006). Digital interventions can transform the everyday urban landscapes by infusing public spaces with interaction as well as with opportunities for "fun and reflection" (Hespanhol et al., 2011: 139).

Regarding the level of interactivity in public space and its effect on user's affective experience, Birringer (2008) identifies two types of interactivity; hot and cold. Cold interactivity refers to the one that derives from the everyday use of technology for practical reasons that makes our life easier such as any form of automatization. On the other hand, *hot or complex interactivity affects human emotions, affections, needs and interaction adding multiple layers on human behavior*. Hot interactivity, which is the one that characterized the engagement with urban media interventions, is often difficult to be analyzed and interpreted by the users as it can be consist of "complex sensuous experiences" (ibid: 238).

In this sense, Gavrilou et al. (2005), through the design and implementation of their urban interactive installation DETOUR, attempted to divert pedestrian flows from a busy walkways to an "alternative strangely pleasant environment" (p. 773). By implementing their media installation, they aimed to transform citizens' affective response to the whole surrounding urban environment. Their observation showed that users were, indeed, involved into the digital interactive experience of the installation, the new location gained much higher population and most importantly people would very often express affective impact as a result of their experience.

In an effort to develop a more detailed approach to human affective experience through the interaction with media interventions, researchers at Nokia Research built upon Costello's and Edmonds's (2007) framework on interactive artworks and introduced PLEX which focuses on pleasure experiences of interactive interventions (Arrasvuori et al., 2011). Their integrative conceptual framework which also acts as an evaluation tool for playful experiences with media installations is based on theories ranging from psychology (e.g. Csikszentmihalyi's flow theory) and philosophy (e.g. Callois) to game design (e.g. LeBlanc). The primary affective components of experience with digital interventions that comprise their conceptual framework are Captivation, Challenge, Competition, Completion, Control, Cruelty, Discovery, Eroticism, Exploration, Fantasy, Fellowship, Humor, Nurture, Relaxation, Sensation,

Simulation, Submission, Subversion, Suffering, Sympathy and Thrill (Arrasvuori et al., 2011).

b)Sensory qualities

People's perception of the built environment involves a number of senses which include but are not limited to, vision, touch, hearing, smell and taste. These senses are not remote from each other, rather they work together to provide a comprehensive and robust understanding of the surrounding context (Fulkerson, 2014). This natural perceptual phenomenon is also called synaesthesia and it, particularly, refers to the stimulation of a sensory modality that evokes the experience of a second or more sensory or cognitive pathways (Harrison and Simon, 1996; Cytowic, 2002). However, as Schreuder et al. (2016) point out that the overall space perception, and particularly the way this is expressed through human behavior, is not only based on sensory cues but also in other factors such as the social context, personality and even mood of the observer. In this context, much work on interaction design has focused on the effect of sensory experiences on emotional and cognitive perceptions (Hassenzahl et al., 2010;Hulten, 2011; Pucillo and Cascini, 2014; Chow,2016)

New media art and interactive installations have the ability to powerfully stimulate human senses (fig. 3.9; 3.10), while at the same time augmenting the non-visual aspects of space (Urbanowicz & Nyka, 2012). Therefore, they can have positive impact on the character and perceptual experience of the physical setting. According to Pallasmaa (2014), the perception of surrounding environment's character is a complex and versatile process which engages more than one senses. In effect, it is a comprehensive effect of various aspects that are integrated into a general atmosphere, mood or feeling of a space. Moreover, Zardini (2006) notes that in an effort to rediscover the character of places, a 'sensory revolution' has emerged in the fields of urban design, architecture and planning. In that context, media interventions in public space could play a key role in the redefinition of the sensory landscape of public space by influencing human sensory experience and consequently transform or augment the overall spatial perception.

Hespanhol et al. (2011) identifying the importance of multisensory experiences in public space designed and implemented the media intervention *Liquid Light,* which encourages ubiquitous interactions by deploying visual experiences, auditory and tactile elements into a multisensory interactive installation. In the same context, Gavrilou et al. (2005) with their digital intervention DETOUR aimed to explore the relation between a multisensory installation and its potential to establish

communicative experiences in public space through the creation of "hybrid environmental experiences".

c)Embodied Engagement

> *'Bodily movements that take place within and happen in relation to works of architecture, architectural surrounds, are to some extend formative of them'*

Gins and Arakawa, 2014: 29

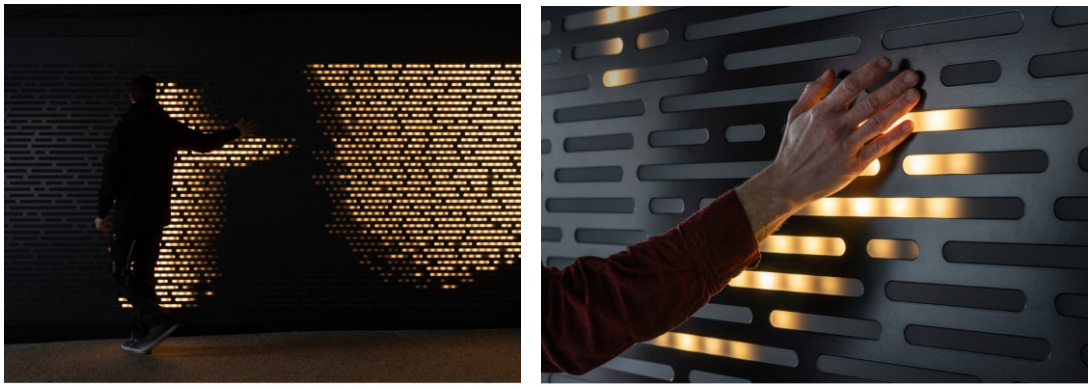


Fig. 3.9, 3.10 Sensory and bodily engagement with the Shadow wall by Jason Bruges (https://www.jasonbruges.com/shadow-wall/)

Besides engagement through senses, bodily experience is also getting increased attention both in terms of how people perceive space but also in terms of how they perceive and interact with digital artefacts highlighting the material and experiential dimensions of interactions with media (Afonso, 2016). Furthermore, Sennett (1994) points out that individual bodily and kinesthetic experience indicates the level of a space's comfort for human encounters' creation as well as the level of setting's stimulation. He notes that often human movement in contemporary public space shows that people are being detached from the space they move into and consequently from people they share space with, making it gradually impossible to share moments with others.

Various interaction models have been investigated around the case of embodiment. Some of them discuss the relationship with performative interaction, where action in space is regarded as performance (Hansen et al., 2011; William et al., 2014), other focus on the idea of synesthetic perception through cross-modal interaction (Fortin et al., 2013), aesthetic interaction which involves body, senses and cognition (Petersen et al., 2004) or also tangible experiences which aim to combine digital and physical features (Hornecker and Buur, 2006).

Furthermore, in the context of museums, galleries and exhibitions, Dudley's (2010) book *Museum Materialities* presents a multidisciplinary approach to the sensory and emotional experience emphasizing on user-object engagement.

Embodied engagement essentially suggests that this type of bodily contact (fig. 3.9; 3.10) with the environment transforms it into a participant rather than an object in the process of experience and perception. Any interaction with an artefact in space is an outcome of our experience with the artefact itself, as well as with the space where it is located (Low, 2003). The underlying idea of embodied engagement traces back to phenomenological studies of Merleau-Ponty in the seminal book Phenomenology of Perception (1945) which for the first time introduced the idea of embodiment. In the book, Merleau-Ponty advocates that perception cannot be considered complete if mind and body are separated. Instead, he emphasizes that perception is a continuous flow emerging from the mind and body located in a context full of sensation. Any interaction with this context is a complex experience that involves body and mind working together.

In the context of digital artefact perception, embodied engagement suggests that bodily experience has an equal role with cognitive interaction and physical structure in the experience and interpretation of the digital object (Punnen, 2014). Similarly, Dourish (2001) building on Phenomenology, asserts that embodied engagement reflects the idea that meaningful interactions between people and digital artefacts are highly related both with the physical context as well as the respective social activities. In essence, this relationship aligns with Dreyfus's (1996) approach which proposes three ways to understand embodiment; body's innate features, bodily skills, and cultural habits. Since then, large body of research (Bilda et al., 2008; Loke and Robinson, 2013; Bakker et al., 2012; Garde-Perik et al., 2013; Svanæs , 2013) has focused on the bodily, social and tangible experiences with digital systems, as well as meaning making and behaviour during situated interaction. These studies, through several viewpoints on embodied engagement build upon Dourish's concept by looking at bodily experience in interaction design.

For instance, Svanæs (2013) suggests two ideas associated with "lived body"; kinaesthetic creativity and embodied perception. This approach involves the process of augmentation of body's sensory perception through interactive artefacts and design related to the kinaesthetic features of body's movement and location. Bakker et al. (2012) explored embodied engagement with tangible interactive sound system, while Loke and Robinson (2013) developed a methodology for the design and evaluation of movement-based interactions, considering that body movement is

crucial in the procedure of real-time cognition. Hornecker et al. (2017) through their extensive review on embodied engagement theories identified three fundamental themes; subjective vs objective perspectives, context vs body, practice vs cognitive structure.

Studies focusing on embodied experience, regardless their very perspective or outcome highlight the importance of this aspect as a crucial element in HCI and interaction design research and, therefore, in the highly related field of situated urban digital installations which very often include interactive features, bodily engagement and tangible experiences.

d) Interpretative Qualities

This set of qualities encompasses meanings or associations deriving from the environment. According to Carmona et al. (2003) people when interpreting information in urban space, they rely on memory for points of comparison with newly experienced stimuli.

The interpretative qualities identified through the application of media interventions in public space are vital in the contemporary urban contexts as offer the possibilities for space's transformation into a new set of interactive surfaces and objects, while at the same acting as drivers for novel interpretations and re-evaluation of space through collective creative participation.

Media interventions and Different perceptions of place

As analysed in the previous chapter, public space represents powerful social meanings as people demonstrate fundamental social norms through their behaviour and activity. However, space as a social construct, at the same time, facilitates various individual interpretations which may subsequently impact on each person's individual perception. In principle, the application of digital interventions in public space may attract the attention of passers-by or bystanders, however, as Akpan et al. (2013) point out, it is the individual evaluation of the entire space that determines whether or not an individual will engage into passive or active interaction with an installation in public realm.

Human interaction with space and its constituent elements is vital for the perception of the urban environment, as interactivity is an aspect that allows people to share experiences, and express themselves (Williamson et al., 2013). Interactivity in public space provides tangible reaction between people and their surrounding as it makes them touch it, hear it, sit on it, walk on it, and ultimately see themselves as part of the

physical environment. It enhances, what Walter (1988) would describe as Pathetecture as seen in the previous chapter. In other words, interactivity with space reflects the ways users decide to invest time, skill, understanding, creativity and imagination in that environment (Dalsgaard et al., 2011), a process that eventually highly affects their memories, evaluation and total experience of the space (Al- Azhari et al., 2014).

Alfonso (2015) notes that digital urban surfaces establish new identities in public space and, essentially, they augment place experience through the new opportunities that they provide for new visible and/or multisensory expressions and space interpretations. Furthermore, Innocent (2016) highlights the variations of space's interpretation resulting from the gradual perception of a media intervention; Giving the example of an interactive digital artwork in public space, he identifies at least three distinct states of space perception depending on the distance between the user and the artwork."Viewing the work at a distance is a distinctly different experience than traversing the space of the work, which in turn is different from engaging in play with its rules and systems." (p.1). This can be also associated with Grønbæk et al.'s (2012) observation that urban space is experienced in 2 major scales (fig. 3.11) : the large distance which invokes feelings of "coldness and grandeur" (p.2) and the small distance which invokes more intimate and loose feelings.

In that sense, Innocent (2016) emphasizes that the digital artwork is not a simple static object but a "distributed across its environment, relying on media ecologies to activate its engagement with different layers of that space". (p. 1)

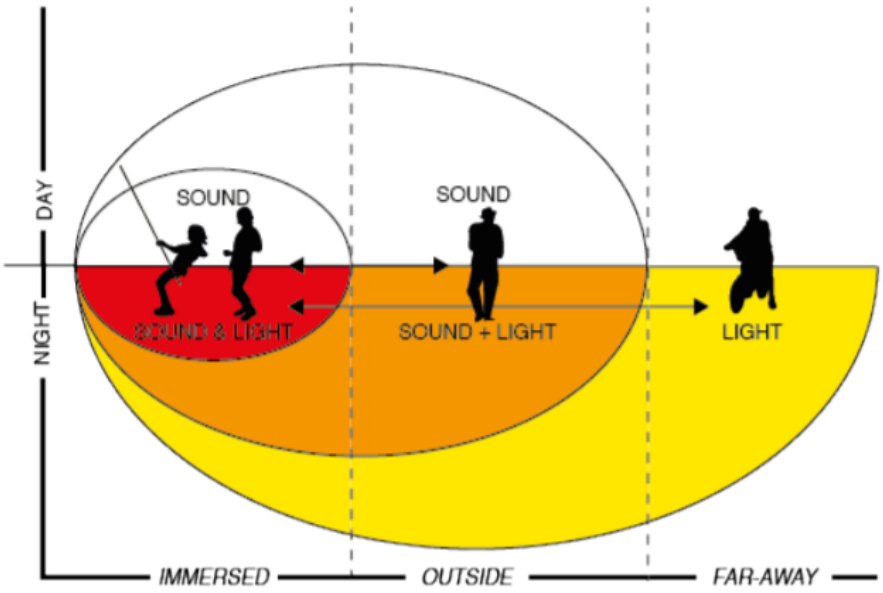


Fig.3.11 Evolving space experience and interpretation according to the distance and level of user engagement with digital intervention according to Grønbæk et al. (2012)

New opportunities for micro-programming, human participation and space appropriation

Creating new experiences by re-interpreting determinate public space, as well as taking advantage of the numerous possibilities a space provides through its design and configuration should not be considered as unwelcome only because a space was not professionally designed for diverse embedded experiences and expressions from the beggining (Noschis, 1978). Microprogramming of spaces, which refers to the framework of temporary dynamic local uses, activities and 'moments' that encourage social interaction in public space, can be play a key role in encouraging participation and appropriation of space by its users (Aurigi, 2013). Besides, it enhances what Smith (1977) would refers to as city's 'syntax' by making it richer and more complex and by fostering the sense of 'cityness'. Shepard (2011) points out that digital interventions enable personal or community appropriation and customization of public space while allowing spatial territorial gestures to take place.

In this context, the combination of physical and digital features that interactive digital interventions represent can augment the interpretative qualities of urban experiences, as they indicate new ways of inhabiting public space while providing creative processes to people in order to reinvent their surrounding space. Building on the ideas of DO It Yourself urbanism and activist culture media art and architecture are now becoming integral parts of meta-design processes as they give effective tools to the community to manipulate and combine media and architecture for their own intentions (Caldwell and Foth, 2014).

Particularly, urban-scale media art interventions, such as Body Movies or the Crown Fountain in Chicago, may provide so many possibilities for artistic expressions and personal interpretations that people essentially become co-creators of the artwork and consequently of a considerable part of the respective public space. As Sassen (2011, pa 4) points out

> *"Each of these multiple small interventions may not look like much, but together they give added meaning to the notion of the incompleteness of cities and that this incompleteness gives cities their long lives, thereby outlasting other more powerful entities".*

Furthermore, some studies have explored the outcomes of integrating features of city hacking and guerilla art through media technologies as parts of community engagement strategies (Fredericks et al., 2015).

Media art interventions are able to 'hack' public space and temporarily transform its given feeling and function. In addition, although engaging the users into the process of artwork creation is not a novel idea in general, situating digital art interventions in streets and squares has added new qualities in public space perception and attracts incomparably wider audience. Most importantly, a major part of which would not visit an art gallery. However, in the context of urban media interventions all types of users are encouraged to express their emotions and thoughts and reveal their presence through diverse modes of performance within the accessible public media environment (Urbanowicz and Nyka, 2016).

Urban Play and Playful behavior

> *"Play and art have often been regarded as related activities that allow us to ignore the exigencies of daily existence and spend time concentrating on the pleasures, skills and powers that our bodies – or other bodies – possess"*
>
> *Banes, 1987: 21*

Space appropriation shares common tents with the notion of play in public space as they both encourage personal expression, experimentation as well as balanced collaboration and teamwork. Furthermore, according to Stevens (2006:805) the urban form itself can structure experiences which are "unexpected, unfamiliar, spontaneous, and risky" which result in a form of "non-instrumental social behavior" or *play in public space*. Particularly, Salen and Zimmerman (2003) define play as the state of "free movement within a more rigid structure" (p.304). This approach, also, aligns with Huizinga's (1949) perception of play which is not merely associated with games but rather refers to a whole performative action which is integral part of human nature and culture. Besides, play is strongly related to individual creativity through the development of new skills and competencies (Russ, 2003; Mainemelis and Ronson, 2006; Willet et al., 2009; Baterson et al., 2013).

Praxmarer and Wagner (2013) explored the aspect of playfulness and performative play regarding the interaction with large scale interactive installations in urban public space. In their study they use the concept of *performative play* as a tool to understand how playfulness encourages different levels of interaction with a digital intervention and, also, to examine the interplay between different roles of the performative action; from passerby to observer and from observer to player. From the perspective of performance, Urbanowicz, & Nyka, (2016) state that users of interactive interventions become actors in a certain space. In this context some people decide to purely watch

the actors-performers while others decide to join them. Frequently, the performers explain or comment the way the interactive installations work (rules of play) with the new performers and finally they end up having a joined participatory experience-performance. Similarly, Willis et al. (2010) identify the "playful encounters" as a common type of the social encounters deriving from interaction with digital interventions, which also encompasses the qualities of shared experience and "social glue". In order to achieve this type of multilayer engagement and playful performance, Praxmarer and Wagner (2013) point out that is fundamental both for the design of the intervention but also for the configuration of public space to take into account aspects and roles of performative play.

Particularly regarding the configuration of the media intervention, Hespanhol et al. (2011) point out that the level of adaptability and scalability of an intervention highly affects its potential to promote urban playfulness as it enables more smooth transitions between the various emotional expressive experiences. Frequently observed playful and emotional expressions during the interaction with digital interventions, as Reilly et al. (2014) observe may include laughter, sabotage, gestures, dance and acrobatics.

e) Cognitive Qualities

The cognitive dimension of place experience are related to the process of thinking about, organising and keeping information about the environment. In essence, refers to how people make sense of it and understand it(Carmona et al., 2003). Two fundamental qualities that refer to how people think about their place experience as well as how the process and organise the information about it and have also been associated with the use of experiential media intervention in public space are: a. memory and identity creation and b. space legibility and navigation

Creating memories and identities

Constant urban transformations, which is a very frequent phenomenon in the last decades, often have as a result the elimination of place experience by preventing users from forming distinctive memories and identities they could associate with the respective contexts, as analyzed in the previous chapters. In effect, mental connection, memory association and identity creation are very critical assets in the process of placemaking as they fundamentally affect individual's perception of a space (Othman et al., 2013).

According to Trigg (2013) interactive interventions and responsive landscapes have the potential to create new urban memories or enhance the existing ones by engaging

people into social and artistic activities which, are considered as she notices, values that are immeasurable and vital. Rewers (2013), also, adds that such recently inscribed place memories can be associated with relevant past events and narratives creating eventually a combination which refers to as 'nostalgic memory'. In that sense, Heath and Pavlaki (2020) note that tactical digital interventions can create new urban identities by encouraging more responsive and human friendly public spaces which multiply users' conceptual associations, meanings and memories. Furthermore, Urbanowicz and Nyka (2016b) also point out that the novel impressions acquired from the interplay with digital interventions in a certain public realm can powerfully transform the entire conception of this space. Moreover, they notice that these impressions can be even sharper if combined with multisensory interaction, body movement, presence of other people and/ or surprising or extraordinary events that people can witness in space. They emphasize that even short-term events of this nature can have a long-term effect in the perception and memorization of the space and they suggest the application of media interventions as a tool for place memory creation and transformation.

Assisting space legibility though visual complexity

Features of visual contrast and complexity in the built environment are fundamental in the creation of legibility, sense of space and preferences (Lynch, 1960; Rapoport and Hawkes, 1970; Rapoport, 1990a). Without spatial diversity all spaces tend to resemble each other and thus, discourage identity making and wayfinding. This form of urban diversity can occur by introducing different construction materials, changes in the landscaping and generally through the development of a certain level of visual interest that will help people to navigate the city (Lynch, 1960, Breckland Council, 2005).

In this context, multiple scholars have highlighted the role of light as a critical design element for the night time image of the city associating it with several physical, psychological and aesthetical aspects. For example, Kutlu & Manav (2013) relate light and light interventions with users' aesthetic perception of space. They emphasize that light, and consequently digital installations, being the only highly visible elements during night time in the city can greatly influence space cognition and understanding by setting various visual cues.

3.3 Urban Digital Art Events: A strategy for the temporary implementation of media interventions in the city

In recent years, urban digital art events and light festivals have begun to gain ground and increase in popularity worldwide. Essentially, these events constitute multidisciplinary initiatives that aim to discuss the role of art and technology in digital contexts and public spaces and integrate in this way dimensions of culture, society, urbanism and innovation. Their plurality is mainly based on the fact that they gather people and input from different backgrounds such as media artists, curators, light designers, architects and community members, acting often as a medium for presentation of novelties in the field of media art and architecture. Furthermore, they are usually planned around a certain topic like, for instance, everyday life, social isolation or active action, establishing in this way critical and creative dialogue on fundamental issues related to modern city and society.

One of the most well-known digital art festivals worldwide is Luminotherapie (Light Therapy) taking place every year at Quartier des Spectacles in Montreal (fig. 3.12). Particularly, this urban event involves the exhibition and celebration of the winning entry of an annual interdisciplinary competition that aims to explore media interventions that aim to animate public space through the creation of participatory projects on a certain theme (Quartier des Spectacles, 2019). Having a major objective to light up and reactivate public space throughout cold the Canadian winter, event's installations are each year applied for the period between late November and late January. During these two months, citizens and visitors of Montreal have the opportunity to ger together and engage with this creative winter experience and interact with digital public artworks, making it a 'must-visit' winter event (Bürklein, 2019).

> *"Luminothérapie aims at stimulating creativity in the disciplines of urban art installations and digital art. Over the years, it has been a springboard for numerous Canadian artists. The creative use of light makes the experiences immersive, participatory or meditative, as part of a larger goal of encouraging the public to embrace the public spaces of the Quartier des Spectacles and giving it a significant luminous stimulus."*

Bürklein, 2019, para.3

Fig. 3.12 LOOP installation at the 8th edition of Luminotherapie, 2018-2019, Montreal. Source: https://worldlandscapearchitect.com/luminotherapie-2018-2019-competition/#.XwX5Cyj0lPY

In context of United Kingdom, a notable digital initiative is *Light Up The North* which constitutes a network of six light and digital art festivals (fig. 3.13) in the northern United Kingdom (Leeds, Lancaster, Durham, Manchester, Blackpool and Newcastle). This consortium brings together digital urban strategies from different cities to share their collective knowledge and support the planning of partner festivals as well as the wider sector of urban light and media art (https://lightupthenorth.com/). The broad scope of this cultural strategy involves the promotion of emerging artists, exploration of technological innovations, development of inspiring projects able to attract large audiences as well as improvement of the artistic quality around media installations (Mitcell, 2018, para.14).

> *"Light festivals are a friendly and spectacular way for people to experience the arts for the first time. It has been great to see more and more people flocking into their city centres to see the extraordinary work of the light artists."*
>
> *Mitchell, 2018, Arts Council England*

Fig. 3.13 Light Night Leeds as part of Light Up the North network. (https://www.artscouncil.org.uk/case-studies/lighting-north)

Other significant digital art festivals include also Ars Electronica in Linz- Austria, Amsterdam Light Festival, Athens Digital Arts Festival, FOTONICA festival in Rome and Japan Media Arts Festival, all aiming to showcase new forms of media art and architecture, encourage people to interact with them and explore new ways of experiencing public space. Digital art events are interesting venues for media architecture, HCI and urban design inquiry as they offer researchers the opportunity to study the effects of media interventions in real-time and on site (Reilly et al., 2014). Furthermore, having a temporary character they also allow for 'before- after' studies that evaluate their effect in everyday public spaces.

3.4 The Challenges of Media Interventions in Public Space

Besides their various benefits for the city and its people, media art and architecture projects as highly complex and multifaceted urban interventions, face also several challenges which can mainly be described as process related, technical or content and context related.

In terms of the process related challenges, Colangelo (2017) notes that there is a certain degree of difficulty in the development and sustenance of the technical frameworks that will allow designers and curators to adjust their work fast and effortlessly in order to address the unique requirements of each site. Furthermore, organizational and technical frameworks need to respond to and balance the multiple

interests involved. These interests can be related to artists, curatorial teams, stakeholders, community councils and sponsors. In this context, careful co-ordination between all actors involved as well as negotiation and thoughtful amendments are necessary in order to deliver the optimal outcome for public space and its users (Dalsgaard & Halskov, 2010).

In terms of the issues regarding the content and contextual relevance of the urban media interventions, Moere and Wouters (2012) point out that an often danger is that they will not be accepted by users causing denial. For instance, a media art intervention deployed in 2010 at the central square of Freiburg provoked an intense sense of rejection, particularly concerning installation's design concept (fig.3.14, 3.15). The light sculpture aimed to encourage people around it to behave more quietly during the late night hours by gradually changing colour from green (allowing more 'free' activity and behaviour) to red (meaning that loud activity is forbidden). Although the users did not accept the idea that a public media installation would indicate their behaviour, they still ended up using the installation by transforming it area to an open-air pub 'with a great atmosphere stressed by cosy red light' (https://popupcity.net/observations/freiburgs-tolerance-pillar/).

Fig. 3.14 (left) Changing light suggests users' 'encouraged' behaviour in Freiburg Tolerance Pillar, 2010 (https://popupcity.net/observations/freiburgs-tolerance-pillar/)

Fig. 3.15 (right) Freiburg Tolerance Pillar, 2010 (https://mhoefert.blogspot.com/2013/10/sleepless-in-freiburg.html)

Regarding the issue of contextual relevance, Dalsgaard & Halskov (2010) also point out that media architectural installations need to be integrated into the surrounding environment both physically and functionally being able to create dialogue with the existing structures and at the same time provide a 'diversity of situations' (p.2280).

Another potential danger of urban media art and architecture, mainly related to systematic initiatives rather individual installations, is that of *light pollution*. Particularly, incidents of excessive use of light for staging 'large-scale light extravaganzas' such as, for instance, the light show opening Beijing Olympics in 2008, have been criticized for damaging the urban landscape and ecosystem through unnecessary luminosity (Yau, 2019).

The technical challenges of urban digital interventions are primarily based on their high demands for structural and technological robustness and stability Dalsgaard & Halskov (2010). Particularly, the constantly changing light and weather conditions which result in the exposure of the installation at various circumstances which designers should have considered in advance. Furthermore, such urban interventions constantly need electric power and, in some cases, internet connection, which makes their application to certain outdoor locations relatively challenging.

The previous challenges, it could be argued, can be summarized into one major architectural and urban design challenge of the design of urban media environments which is that of *responsiveness and robustness*. It essentially refers to the constant pursue of the requirements of the socio-spatial context, while keeping a balance with critical economic and logistical aspects and at the same time ensuring that interventions will remain functional and compatible with the ever-shifting urban dynamics.

3.5 Conclusions- Necessity of the research

The main aim of this chapter was to examine the potential of situated digital technologies both as a novel 'construction material' in the city and as a new experiential medium. In this regard, it identified two major types of urban media interventions; those that emphasize on their functional- technical qualities and those who focus on the experiential and human-centered aspect. The debate between these aspects is very common and frequently discussed within urban design discourses (see for example Pissourios, 2014), however their digital augmentation can result in rather different outcomes for public space and the city. **Subsequently, building upon study's theoretical framework, the major affordances of digital urban installations in three fundamental dimensions of place experience were assessed (as found in chapter 2); the contextual, the social and the perceptual.**

Fundamentally, **it is possible to identify similarities between study's theoretical framework as articulated in** Chapter 2 and others previously proposed in the scholarship, notably those presented by Carmona et al. (2003), Tibbalds (2000), Jacobs and Appleyard (1987) as well as Bentley et al (1987). All aforementioned frameworks deal with urban design as an organic and multidimensional activity and relate to the 'making places' tradition (Carmona et al., 2003:9). These theoretical models have all sought to identify the desirable characteristics of successful urban space and public realm, without however making any reference to their digital dimension which is currently highly critical. **From a practical perspective, following the major theoretical models, the prevailing applied design frameworks in the UK context also fail to incorporate the digital element in any form of their suggested urban strategies, policies and assessment criteria.** Key design strategies -such as Local Plans, National Planning Policy and the National Design Guide) which aim to illustrate how well-designed places can be achieved in practice (MHCLG, 2020) although providing recommendations regarding public space's activities, proximity to amenities, landscaping and safety issues, they lack provision of guidelines related to the thoughtful integration of the digital element into public realm.

Considering the literature reviewed, urban media interventions can contribute to the redefinition of public space in multiple ways. Particularly, they can affect the physical arrangement and use of space and, thus, influence the respective socio-spatial context. They enable new forms of collective experiences and activities, while also offering various new cues in individual's perception of the environment. However, the discussions show that there are also some critical challenges in the design, planning

and implementation of urban media installations that could potentially cause serious issues in the process of their application the context of public space and even pose threats for its overall quality and level of responsiveness to its users. **That is because current urban design theories and frameworks fail to articulate linkages with the emerging digital dimension of urban space and address its respective issues. So how can urban media interventions achieve their full potential and essentially inform existing urban design frameworks?** It is realized that the development of a healthy balance between installation's content, function, surrounding context and social dynamics as well as a constant response to the changing community requirements is necessary in order to deliver a context-sensitive intervention that positively articulates a place's character and experience. Yet, in order to achieve this balance, the affordances of urban media installations in place experience need to be thoroughly explored, determined and subsequently **be set up within a placemaking and urban design framework**. In this respect, **a gap within the literature has been identified**, as there is lack of comprehensive research that provides evaluation of public space as place whereby digital experiences have been applied.

This gap in the research may be in part due to the complex nature of the topic and issues of interdisciplinarity when attempting to understand it. Media architecture and urban media art, being rather recent areas of research and practice, evolve at the intersection of physical and media space and require a form of understanding that is beyond traditional built environment theories. This approach needs to integrate knowledge from the fields of architectural design, urban design, interaction design, lighting design, user experience, community engagement, environmental psychology and more. Therefore, although there have been several studies on the social and technical aspect of such projects in the field of interaction design and community engagement, their integrated effects have not been investigated yet due to, potentially, a wide range of non-linear relationships that characterize their process as environmental stimuli. Consequently, although there is evidence that digital interventions can affect various aspects of urban experience it is not known how urban media installations (both individually and as a network of interventions) should be designed, planned and effectively combined in order to encourage positive social, emotional and behavioral effects according to specific contexts. There is a need to facilitate design, planning and curation process in order to deliver the best results in concept creation, design development, and project implementation.

Hence, it becomes evident that a systematic place-based approach that will look at the reciprocal relationship between the physical space, place and digital intervention would be critical. Essentially, there is a fundamental need for multi-disciplinary research grounded into urban design context which will set place and its experience as a starting point for a holistic evaluation of digitally augmented public spaces. In this sense, it is crucial find new ways of understanding these effects analytically and also synergistically in order to unveil urban media interventions' potential as tools for placemaking and as catalysts to address the multifaceted challenges of contemporary cities.

Chapter 4

Methodology

The previous chapter traced the gradual introduction of digital element as part of the physical infrastructure of contemporary cities, and its broad effect on public life and urban dynamics has been explored. The emergence of new practices and initiatives in the context of architecture and urban design - media architecture, media art and digital placemaking- highlight the crucial role of media initiatives in the process of contemporary placemaking. The goal of this chapter is to develop an integrative methodological framework for the assessment and evaluation of the versatile effect of digital interventions in public space through a contextual, social and perceptual perspective of human experience, while also to investigate their contribution in the strategy of placemaking. The conceptual framework draws on the theoretical framework introduced in chapter 2 and creates a holistic and innovative view of place experience in the digitally enhanced public space which will subsequently be evaluated through a set of mixed research methods and approaches.

4.1 Methodological Framework

As highlighted in Chapter 2 the developments in Place theory seem to offer grounds for theoretical interpretations of holistic human-environment relations by integrating human behavioural, psychological and social functioning with the spatial and material world. In this section, study's methodological framework is explored which essentially outlines the underpinnings of the research together with the theoretical framework. To do that, it will introduce the main conceptual framework of the study which fundamentally links the theory of place experience with the key aim of the research and subsequently, it will review the basic philosophical assumption, methods and approaches related to this study.

4.1.1 Conceptual Framework

In cities people act clearly both as individuals (Hall,1966) and as social beings (Greenbie, 1978). Furthermore, as we saw in the previous chapters, the form and character of most spaces in the city, especially public space, modulate human interaction with others, as well as with the environment as a whole, triggering emotional, cognitive, effective, and behavioural processes, both on a personal and group level.

The overarching aim of this research is to study and evaluate the overall and complex implications of the application of a network of digital interventions in the experience of public space (fig.4.1). Drawing widely from the academic literature and evidence-based design, the notion of experience has been approached and analysed through various perspectives and theories related to Place and public space configuration. Through this comprehensive review it was realized that place experience is a dynamic idea that encompasses the reciprocal and shifting interaction between humans and their spatial and social context and it can be constantly transformed and redefined through physical transformation and the implementation of new environmental stimuli; especially ones rich in perceptual, contextual or social affordances.

Furthermore, through the subsequent literature review on the main experiential qualities of digital interventions in urban environments along with an exploration of the practice of placemaking and adaptive urbanism it was found that, these type of interventions may influence place experience in multiple interconnected ways. Ultimately, these ways can be identified in spatial re-configurations, transformations in space's social context as well as perceptual affordances.

A conceptual framework has been developed in response which aims to address and evaluate the versatile effects of urban digital interventions in public space in three

fundamental categories as well as the interplay between them. *This asserts that critical aspects of the human experiential dimension in a digitally enhanced environment can be understood as an aggregate of three dimensions relating to: a. how these installations manage to transform the local socio-spatial context, physical form as well as the local urban dynamics, b. how social experience in public space can change after the application of a set of media interventions, c. how individual perceive and interact with space differently after its digital enhancement.* Each category has further dimensions of detail to reflect. For example, the dimension of social experience incorporates the collective community activities and actions that take place in the study area, the level of human interaction and triangulation as well as the interaction patterns.

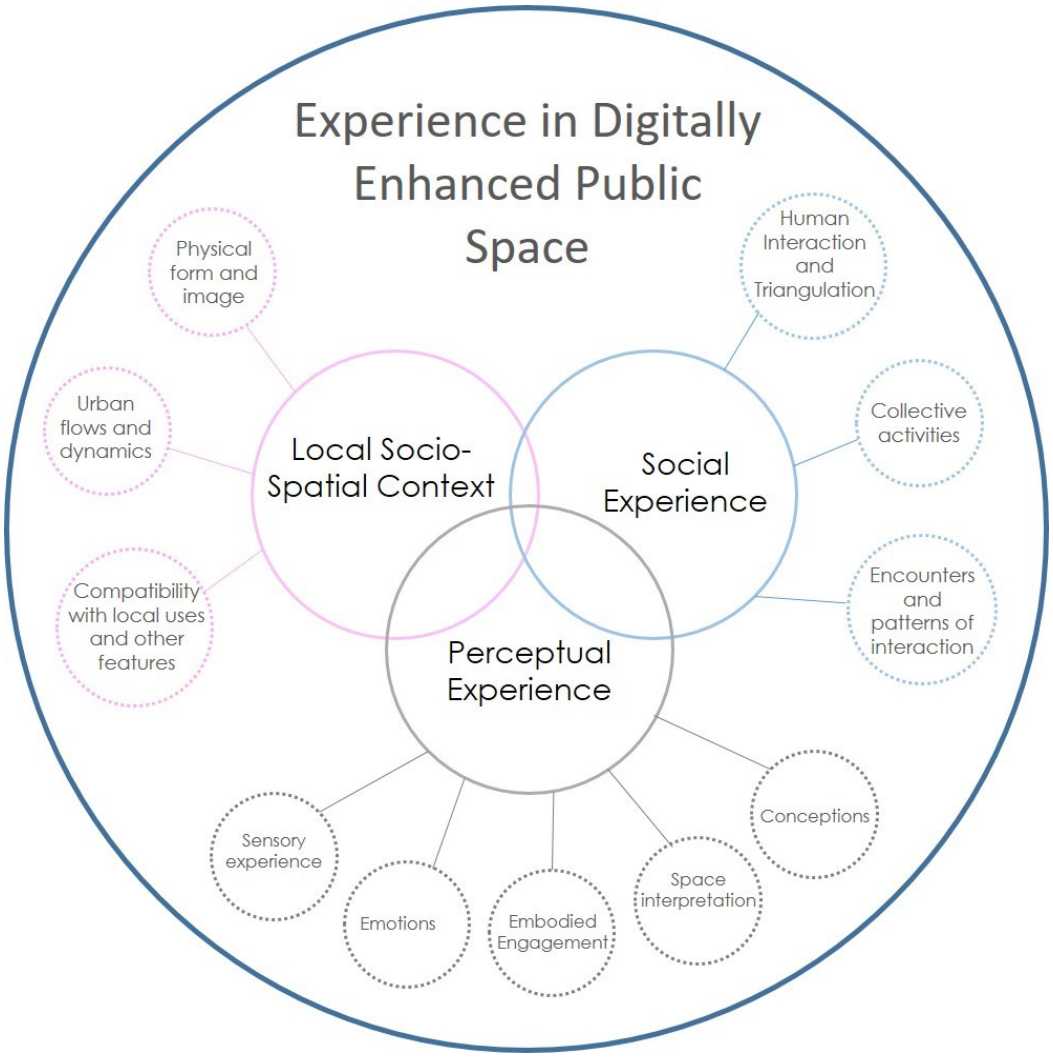


Fig 4.1 Conceptual framework; Breaking down the primary aspects that form human experience in digitally enhanced public space

Fundamentally, this conceptual framework allows for the evaluation of urban digital interventions in different public space contexts and typologies as primarily experiential objects that may impact on the physical, conceptual, emotional and social setting of public realm. Ultimately, the study attempts to develop a comprehensive and robust model of urban experience from a pragmatic point of view blending a phenomenological, ethnographic and behavioural perspective.

4.1.2 Philosophical Assumptions and Strategies of Inquiry

Place experience in digitally enhanced public space is associated with context, objects, actions, interactions and events and can embrace all the forms and elements emerging from the interplay among these aspects. Consequently, research methods and overall strategy must therefore appropriately address the versatile character human experience in such setting and look at its implications both from the perspective of the individual but also from the perspective of the community.

The philosophical background and methodological framework that have been applied to address the research aim and objectives will be extensively presented throughout this chapter. The philosophical position of the researcher and theoretical basis guide the study's methodology and data analysis. Thus, to justify the application of the specific research methodology it is critical to explore this study's assumptions about reality and human knowledge (Crotty, 1998). The theoretical underpinnings for this research suggest that methodology, epistemology, theoretical standpoint and methods are all interrelated aspects (Crotty, 1998). Prior to the analysis of the study's fundamental belief system and theoretical basis, it has been considered essential to clarify the main elements that comprise them; a) ontology, b) epistemology, c) methodology and d) methods.

a. Ontology

Ontology and epistemology form the study's basis as they constitute the foundation of the whole research structure. (Grix, 2004). Particularly, according to Richards (2003:33), ontology regards "the nature of our beliefs about reality". The ontological question guides the researcher throughout the inquiry of the kind of reality that exists:

"A singular, verifiable reality and truth [or] …. socially constructed multiple realities"

Patton, 2002: 134

b. Epistemology

According to Gall et al. (2003:13), epistemology regards “the branch of philosophy that studies the nature of knowledge and the process by which knowledge is acquired and validated”. Essentially, it focuses on “the nature and forms [of knowledge], how it can be acquired and how communicated to other human beings” (Cohen et al., 2007: 7). Epistemology is associated with the examination of aspects of “[…] objectivity, subjectivity, causality, validity, generalisability” (Patton, 2002: 134). Adopting a certain ontological belief system leads the adoption of particular epistemological assumptions. Consequently, if a concrete verifiable truth is assumed in a study then the standpoint of the researcher involves “an objective detachment in order to be able to discover ‘*how things really are’ and ‘how things really work*’ ” (Guba & Lincoln, 1994:108). On the contrary, when researcher’s beliefs regarding the subject of inquiry leans towards the existence of multiple socially constructed realities then they reject the idea of people being studied like objects of natural sciences; they get involved with them and seek to explore phenomena in their respective contexts**.** *In the present study the researcher adopts the second perspective that asserts the existence of multiple realities that can be studied holistically, since an objective approach would treat human experience as “separate, fragmented and atomistic” (Charmaz, 2006: 331).*

c. Methodology

Methodology constitutes an *“articulated, theoretically informed approach to the production of data”* (Ellen, 1984: 9). It is concerned with the study and critical analysis of data. Essentially, it involves the main body of the research study as it refers to the *“strategy, plan of action, process or design”* that subsequently affects the selection of research methods (Crotty, 1998:3). Therefore, research methodology is critical for the decision regarding what kind of data is required and which data collection techniques are appropriate.

d. Methods

Methods refer to specific ways of approaching, collecting and analyzing study’s data. Methods’ selection depends on research design and researcher’s philosophical and theoretical framework. Yet, the application of particular research methods is not directly associated with certain ontological and epistemological assumptions (Adil and Khalid, 2016).

Different approach towards these four elements lead to different research paradigms which are mainly three; a) qualitative, b) quantitative and c) mixed methods (Creswelll, 2003; Tashakkori and Teddlie, 1998). Generally, *quantitative research paradigm* focuses on testing objective theories by exploring the relationship between certain variables. These variables are reflected on data that can be measured and analyzed through mathematical and statistical processes. It is noteworthy that research theories resulting from this paradigm are developed deductively. *Qualitative research*, on the contrary, seeks to explore and interpret meanings and experiences related to people or groups of people from human or social perspective. The main characteristics of this research paradigm in that research questions and objectives emerge and change throughout the research process, data are mainly collected in participants' setting and, finally, knowledge is inductively developed through data analysis that starts from particular themes and gradually moves towards general ones. The combination of the quantitative and qualitative approaches constitutes the *mixed methods* paradigm and it is a model based on the collection of both qualitative and quantitative evidence and the subsequent application of integrative research design for the broad and deep understanding and validation of data (Johnson et al., 2007).

In terms of the relationship between the primary philosophical assumptions and the main research paradigms, Creswell (2003) identifies four major epistemological models; Post-positivist, Constructivist, Transformative and Pragmatism (table 4.1).

Post-positivist paradigm; these epistemological beliefs represent the traditional research models and they refer to quantitative research. This paradigm is also referred to as "scientific method" (Phillips and Burbules, 2000).

Constructivist paradigm is mainly considered as a model of qualitative research. This belief system suggests that humans seek to interpret the world they live in and subsequently they construct knowledge and meaning based on their experiences. Through this approach researchers need to search for the complexity of these ideas of the world rather than narrowing them into particular categories (Crotty, 1998).

Transformative paradigm emerged as a response to post-positivism which was considered to introduce theories and laws that were incapable of completely interpreting real-world problems such as marginalized communities, issues of power, marginalization and discrimination. This paradigm combines social and political theories in order to address research questions that concern social inequities (Donna, 2007).

Pragmatism is a model where the researcher concentrates more on the research problem rather than the methods that can be applied and they adopt versatile and diverse approaches to examine a problem. Therefore, pragmatism is generally associated with mixed methods research. In this research paradigm researchers have the flexibility to choose and combine different research methods and approaches to collect and analyse data (Cherryholmes, 1992).

	Qualitative research	**Quantitative research**	**Mixed methods research**
Philosophical paradigm	Constructivist/transformative	Post-positivist	Pragmatics
Research design	Narrative research Phenomenology Grounded theory Case study	Experimental designs Surveys	Convergent Explanatory sequential Exploratory sequential Transformative, embedded, multiphase
Research methods	Emerging methods Open-ended questions interviews, observation data, audiovisual data text and image analysis interpretation	Pre-determined Methods Instruments based questions Performance data Statistical analysis Mathematical interpretation	Both pre-determined and emerging methods Both open-ended and closed-ended questions Multiple forms of data Statistical and text analyses Across databases interpretation

Table 4.1: Main research paradigms. Adapted from Berta et al., 2016 elaboration from Creswell, 2003; Tashakkori and Teddlie, 1998

4.1.3 Pragmatism

Pragmatism can be regarded as a philosophy of change and transition in the sense that it considers that the world is emerging rather than it is ultimately completed and permanent. The existence of the external world is very crucial and tangible and the basis of human existence. Yet, this does not imply that the external world is, or will ever be, fixed and unchangeable. In this sense, as Shalin (1986:10), a contemporary pragmatist construes "…(world for pragmatism is) *brimming with indeterminacy, pregnant with possibilities, waiting to be completed and operationalized".*

In terms of research strategy and methods related to pragmatism, it can be identified in Table 4.1 that this philosophical paradigm is mainly associated with mixed methods research approach. Particularly, aligning with its central view regarding the dynamically emerging world, pragmatism advocates the use of both predetermined and emerging methods, deploys various data collection tools and it explores both numerical and non-numerical data (Berta et al., 2016). Furthermore, according to Cresswell (2003) pragmatic mixed methods research can be also classified into four major research design types that can be outlined as follows:

a) *Convergent parallel mixed methods* is a type of design that combines and incorporates both quantitative and qualitative into the research process in order to conduct a comprehensive and in-depth analysis of the research problem.

b) *Explanatory sequential mixed methods* is a type in which a quantitative research is initially carried out and the data is analysed accordingly quantitatively but finally the researcher building upon the results explains them further qualitatively.

c) Exploratory sequential mixed methods involves two major research phases. The first one is a qualitative stage that can entail the development of evaluation tools or for identifying study's variables that will subsequently need to be included into a follow-up quantitative study.

d) More advanced mixed methods type suggests advanced research designs such as transformative, embedded and multi-phase mixed methods. Particularly, transformative mixed methods is a design that applies theoretical framework of social justice and power as basis for the study, while in embedded mixed methods design quantitative and qualitative data are incorporated into a larger experiment. Finally, multiphase design is often deployed for the evaluation and program of interventions where simultaneous or sequential methods are applied progressively over time in order to interpret long terms effects.

4.1.4 Mixing Methods to Unfold The Media and Urban Experience

Mixing methods in urban design

Place experiences are versatile and dynamic, depending on the relation between spatial context, human perception and social activity. Therefore, place experience studies mostly explore the quality of built environment in combination with crucial social and psychological aspects of everyday life. However, the aforementioned fields of inquiry are not necessarily distinct and, thus, contemporary place experience studies tend to be interdisciplinary in nature requiring integrative approaches and mixed methods.

Mixed methods are increasingly popular in the fields of urban studies and social science following and promoting the principles of the pragmatist paradigm (Creswell and Garrett, 2008). Particularly, by applying a mixed-method approach researchers are able to select and combine certain methods depending on the nature of the problem examined. In this sense, “what works” is more significant than the “purity” of the approach, especially in terms of research objectives that do not adhere to an entirely quantitative or qualitative approach (Armitage, 2007). According to Creswell and Clark (2006), through merging qualitative and quantitative methods researchers can offer a more comprehensive interpretation of the research problem than either approach applied alone**. Especially, for studies dealing with the diverse, multi-dimensional and complicated issues of urbanism reflected on the investigation of public space and its performance mixed methods can often provide more robust and powerful results (Rittel and Webber, 1973).**

Although the key aim for the utilization of different methods and approaches is to increase research robustness by collecting and analysing evidence from various sources, six basic rationales, adapted from Mason (2006), for the selection of such an approach can be also identified:

a. To encourage the broader and deeper investigation of a research problem.
b. To address relevant or emerging research questions or parts of research questions that are distinct in terms of analysis and interpretations having their own internal logic.
c. To triangulate the data in order to improve the reliability and validity of research findings
d. To reinforce one another, and consequently the overall methodology, by exploiting the strengths and overcome the weaknesses of each method and approach.

e. To control creative tensions among methods by drawing potentially new and unpredicted results
f. To opportunistically take advantage of any data source may be already available of emerge that might be useful in the examination of a research problem.

The Pragmatist approach in the research of interactive environments

Experience is an emergent phenomenon that is comprised both of active and passive features. The experiencing person is mutually subject to the effects of the situation while, at the same time, acting upon it. Therefore, the reciprocal relationship between active and passive elements of an experience are focal in the process of understanding the nature and quality of it (Dalsgaard, 2009). Experience occurs in a dynamic state of sequence of various instances which form and overall ongoing flow. According to the famous pragmatist J. Dewey:

> *"In an experience, flow is from something to something. As one part leads into another and as one part carries on what went before, each gains distinctness itself. The enduring whole is diversified by successive phases that are emphases of its varied colors."*

Dewey 193:45

Interaction design primarily adopts this approach to experience building upon Deweyan pragmatism which has also inspired various other areas of research such as aesthetics and art (for example Stroud, 2014), psychology (for example Barbalet, 2004) and, more recently, interaction design (for example Wakkary, 2009) and media architecture (Dalsgaard, 2009).

One of the most extensive investigations of the topic is McCarthy and Wright's (2007) Technology as Experience, in which the scholars develop precisely upon pragmatist Dewey and other pragmatists to build a "felt life" understanding of experience with technology. In their influential book, McCarthy and Wright (2007) **identify four elements of human experience with technology; compositional, the emotional, the sensual, and the spatio-temporal.** Consequently, by examining these interrelated aspects they seek to understand how people interpret technology in their life. Furthermore, this pragmatist understanding of human experience can be identified in various research papers and studies in interaction design such as Forlizzi & Battarbee (2004), Forlizzi & Ford (2000), Jacucci et al. (2005). Particularly, the distinction and interplay among the overall and distinct elements of experience seem

to influence interaction designers who often seek to explore definitions and interpretations of the concept of experience (Dalsgaard, 2009).

This approach to the evaluation of interactive experience aligns with the scope of this PhD study as it understands human experience as an aggregate of relational aspects related to the spatial environment, emotional and sensory qualities, as well as their compositional features. However, as the present study deals with the phenomenon of human experience situated in the urban context, where citizens act simultaneously as individuals and as members of a larger community group, the significant aspect of social experience has also been considered in the formation of the conceptual and evaluation framework.

Through a pragmatist perspective, this research study utilizes both multiple qualitative methods and quantitative data and it can be therefore described as both mixed and multimethod. In particular, this study is qualitative in terms of the analysis and synthesis of the characteristics of human experience with interactive installations in public space, however it also applies quantitative techniques and methods of data collection which, respectively, provide numerical and statistical data**.** In terms of the specific mixed method research design, this study applies the type of *convergent parallel mixed methods* which, as analysed before, is based on the concurrent utilization of qualitative and quantitative methods in order to address the research questions and objectives comprehensively. In other words, during the research process both sets of data have been collected and analysed in parallel and corresponding results have been merged and combined for the discussion of the final findings.

4.1.5 Qualitative Approaches and Case Study Approach

In terms of qualitative research conduction, various approaches can be applied, however Leedy and Ormrod (2001) identify the following five: Phenomenological approach, Content Analysis, Ethnography, Grounded Theory and Case Study. Creswell (2003) illustrates how these approaches can address different research requirements. For instance, case study and grounded theory research investigate processes, activities and events, whereas ethnography examines broad social or cultural behaviours of individuals, groups or communities. Case study and phenomenology can be both utilized to study individuals.

Phenomenological Study

The aim of this approach *is "to understand an experience from the participant's point of view"* (Leedy & Ormrod, 2001: 157). The key focus is to interpret an individual's perception of an event or situation looking deeply into the state of a lived experience. Creswell (1998:52) notes that the basis of this study is the search for *"the central underlying meaning of the experience and emphasize the intentionality of consciousness where experiences contain both the outward appearance and inward consciousness based on the memory, image, and meaning"*. The challenge of this approach is that researchers often have also a personal involvement into the experience studied so it is necessary for them to set aside all potential prejudgments (bracketing).

Content Analysis Study

For Leedy and Ormrod (2001: 155) content analysis study is *"a detailed and systematic examination of the contents of a particular body of materials for the purpose of identifying patterns, themes, or biases"*. Content analysis material includes forms of human expression and communication such as documents, books or films in order to identify visual, verbal or behavioural patterns and themes related to a certain topic.

Ethnography

Ethnographic is a type of approach deriving from anthropology and sociology. Particularly, in such study the researcher investigates common patterns of behaviour and actions of an entire social or cultural group in their everyday setting over an extensive period of time. Data collection tools mainly include observations and interviews (Creswell, 1998).

Grounded Theory Study

Creswell (2003: 14) describes grounded theory as the type of approach where *"researcher attempts to derive a general, abstract theory of a process, action, or interaction grounded in the views of participants in a study"*. In other words, this approach is based on certain data (*grounded*) and their analysis in order to develop particular theory, that is not existing in the literature (Leedy and Ormrod, 2001). This approach has been often applied in social science as it mostly looks at people actions and interactions. The process of research execution of a grounded theory study is similar to that of a phenomenological one because in both cases interviews can be conducted (Creswell, 1998).

Case Study

Creswell (2003) defines case study as an approach where the researchers deeply investigate *"a program, an event, an activity, a process, or one or more individuals"* (p. 15). Furthermore, for Leedy and Ormrod (2001) a case study requires a certain pre-determined time frame and may involve either a single-case or multiple cases (Creswell, 1998). Data collection process in this approach is broad and draws from various sources such as observations, interviews and review of archival documents or physical artefacts. Often, the researchers conduct field-work at the studied site and later patterns in data are identified that are then associated with theories (ibid).

Case study and the urban context

Yin (1994), in his seminal book *Case Study Research: Design and Methods,* points out that this form of study is appropriate for the development of a theory due to the comprehensive and in-depth analysis it involves; this theory can then be tested in other contexts, studies or through different empirical investigations. Groat and Wang (2002), looking at the approach of case study in the context of architecture, **associate the use of mixed research methods with case study, emphasizing that it could be particularly informative to investigate settings or situations holistically through the application of multiple data collection and analysis tools.** Particularly, they refer to Jane Jacob's (1961) seminal study on New York city's vibrancy[4], advocating that various researchers in the context of built environment have chosen the approach of case study precisely to benefit from utilizing different research techniques in the exploration of real-world contexts. By exemplifying Jacob's work, Groat and Wanag (2002) link case study approach with:

a) the examination of complex urban dynamics

b) the utilization of various empirical methods such as observations, interviews and document review

c) the building of a theory with the potential of a wider application

In a similar sense, Muir (2008: 106) identifies six reasons why a case study is a powerful approach to uncover phenomena regarding to the urban environment:

> *"Spatial focus, use of multiple research methods, flexibility of research design, the experience of multiple perspectives on the case; the*

[4] In the book *The Death and Life of Great American Cities: The Failure of Modern Town Planning*

importance of context and the depth and richness of data that can be obtained"

Case study is considered the appropriate investigative strategy in this research because human experience, which is the central focus and the main variable of the study, needs to be tested and assessed in a real urban environment. That is because the effects of spatial context on the urban experience are profound and versatile and therefore, the various human experiences in public space through the interaction with digital installations, by definition, cannot take place in a laboratory.

This case study also enters the **phenomenological inquiry**: as a key aim the research is to investigate and understand a person's experience of public space during the implementation of media installations and *to "attempt to see things from that person's point of view"* (Bogdan and Taylor cited in Bryman, 2016 p. 27). In addition, as this study seeks, also, to explore the effect of such interventions on the local and everyday urban dynamics and fundamentally considers public space as social environment, an ethnographic approach is deemed as necessary in order to uncover the potential effects on people's behaviour, activity and level of socialization as members of a wider community group of the city (Goffman, 1959; Liebow, 1967).

However, by adopting principles of grounded theory, the interest goes beyond the mere description and recording of the information and moves towards discovering a theory or generating an abstract analysis of a specific finding through the identification and re-synthesis of themes and patterns in the study. Therefore, grounded theory particularly guides this study throughout the data collection and analysis process which ultimately aims for argumentative generalization in the procedure of data assessment (Glaser and Straus, 1967; Strauss and Corbin, 1997).

Embedded case study for the investigation of multiply digitally enhanced public space

Generally, the more contextualized and versatile the topics of research, the more effective case study as research approach is considered to be. Therefore, the utilization of case studies is gaining increasing respect in the complex fields of sociology, urban studies, environmental and planning sciences.

As one major concern of the research was to explore deeply and holistically the phenomenon of urban experience in public space, several methods was decided to be applied. In that sense, a single case would give the chance to the researcher to

precisely collect data through each research method separately by doing several studies and by applying multiple data collection techniques. That would subsequently have as a result a profound and detailed examination of all the evidence provided, an explicit assessment of the selected approaches/types of urban experience, and finally appropriate data triangulation and synthesis in order for a thorough and integrative examination of human experience in public space to be formed. Also, according to the main research aim which is to explore the variations of human experience through trails of digital interactions in public space, multiple locations and typologies that include media installations within a broad public realm were going to be studied and compared. As a result, although the main case study in terms of spatial and temporal context is one, there would be at least three separate public space locations/ typologies accommodating installations that would be explored. Ultimately that led to the realization that a combination of multiple case studies (public realms) wouldn't be effective and suitable in terms of proper application of all different research methods and data analysis because of the excessive volume of data.

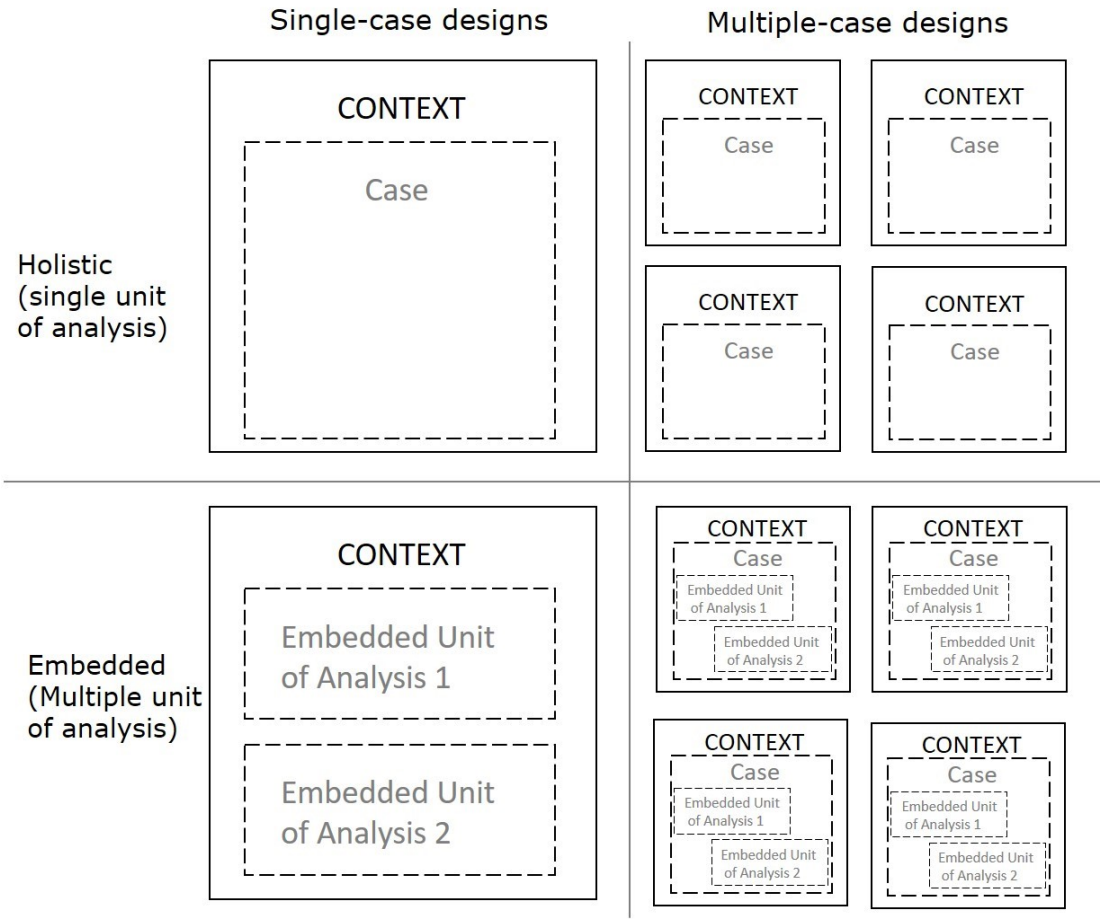


Fig. 4.2 Basic Types of Designs for Case Studies Source. Adapted from Yin (2009: 46)

Embedded case studies include more than one unit of analysis (fig. 4.2), often combining both qualitative and quantitative methods. In the sub-cases (units) which focus on different crucial aspects of the same case, diverse methods can be applied (Yin, 2009). As a result, an embedded case study would give a rich understanding of how people feel and respond to different environments in terms of both public space configuration but also the nature of digital intervention.

4.2 Pilot Studies

The pilot study was planned and conducted during the stage of review and analysis of relevant research methodologies in order to assist the development of the final methodological framework and contribute to the refinement of research questions. Essentially it was part of the preparatory work taking place before the main data collection and was very critical for the decision of the research methods and the final research design.

According to Crotty (1998), the epistemological position of a research study is rarely established at the beginning of the research process, but rather research projects often start with a real-life issue or question and subsequently appropriate methods are explored in order to address it. Therefore, it was considered necessary to test a series of methods and approaches to evolve the design of the study in more detail. The pilot studies involved both primary and secondary research aiming at the deeper understanding of the factors that influence human experience through the interaction with media installations in different urban contexts and provided some initial observations and patterns for further reflection and exploration through the main study.

The first pilot study was conducted over the course of three days in October 2018, while the second one was carried out through secondary research which involved document analysis in November 2018. The purpose was not solely the testing of potential methods but also for the researcher to develop a comprehensive understanding of what data can be obtained. The hope was that it would also allow the researcher to assess whether the overall research objectives were appropriate and attainable. The key aim was to build an initial first-hand understanding of how users perceive and use public space in a period of digital enhancement with media interventions.

4.2.1 Pilot Study Selection

The main requirements for case study selection set by the researcher prior to the conduction of the pilot studies were mainly three:

a) The case study needed to involve more than one media installations in order for the researcher to be able to examine the effects of such interventions in different public space typologies, sizes and local contexts; furthermore, a higher number of installations creates a type of digital network or "layer" in the city aligning with the concept of digital placemaking which mainly forms the scope of this PhD study.
b) The media interventions had to be located in an urban context and, especially, within the city centre, as the assessment of any suburban or rural location would be out of this study's scope.
c) Preferably, the digital interventions should be temporary in nature and recently implemented on the urban setting so that their clear effect on typical public space experience could be identified and explored.
d) As one important hypothesis of this study is that digital interventions in public space may improve its liveability levels, especially in winter period when human activity is critically lower than in warmer time-periods, cases deployed in winter seasons would be preferred.

Taking into consideration the above requirements, the first pilot study which would primarily involve field work was planned for the period 3-6/10/2018 in Leeds city and aimed at the assessment of a number of media installations deployed for two days in light of the festival Light Night Leeds, 2018. The site visit started one day prior to the installations' application and finished after their removal to allow time to researcher to conduce a brief site and context analysis of the city without the installations and carry out a 'before and after' study.

The second pilot study followed a quite different approach as it was involved a secondary research and focused on more detailed aspects of the research objectives. The main case study requirements were again met but this time a field trip was not considered necessary as the main purpose of the study was to test tools of digital ethnography such as mining social media and , also, to carry out some content analysis on documents and reports found online. The selected case again involved a site enhanced with media installations in light of a digital art and lighting festival in the city of Poole, Light Up Poole 2018.

4.2.2 Primary Research Study

Considering the wide ranging and complex nature of digitally enhanced public space, it was deemed appropriate to conduct at least one scoping trip to test and refine the fieldwork procedures. The first pilot study was then conducted in the field and involved the assessment of some urban digital installations deployed in public spaces in the city centre of Leeds UK, during the festival Light Night 2018. Below there is an outline of entire pilot study process.

Pilot Study 1- Light Night Leeds 2018	
Dates	Trip: 3-6/10/2018, Event: 4-5/10/2018 (6-11pm)
Weather	Average 7 °C, rainy, real feel 4 °C
Locations	The city was divided into zones for the event - Millenium Square Zone, Town Hall Zone, Headrow Zone, Victoria Zone, Briggate Zone, Station Zone, Arena Zone, South Bank Zone, Soyo Zone, University Zone and digital installations were located accordingly to all of them
Public Space	Various types of public spaces had been selected for the accommodation of digital interventions; Main civic plaza, internal courtyards, pocket park, retail streets, waterfront promenades
Installations	60 light and sound pieces including both interactive and non-interactive installations (6 assessed)
Methods applied and tested	Field observations and on-site interviews with users and event's stuff

Table 4.2 Pilot Study 1 outline

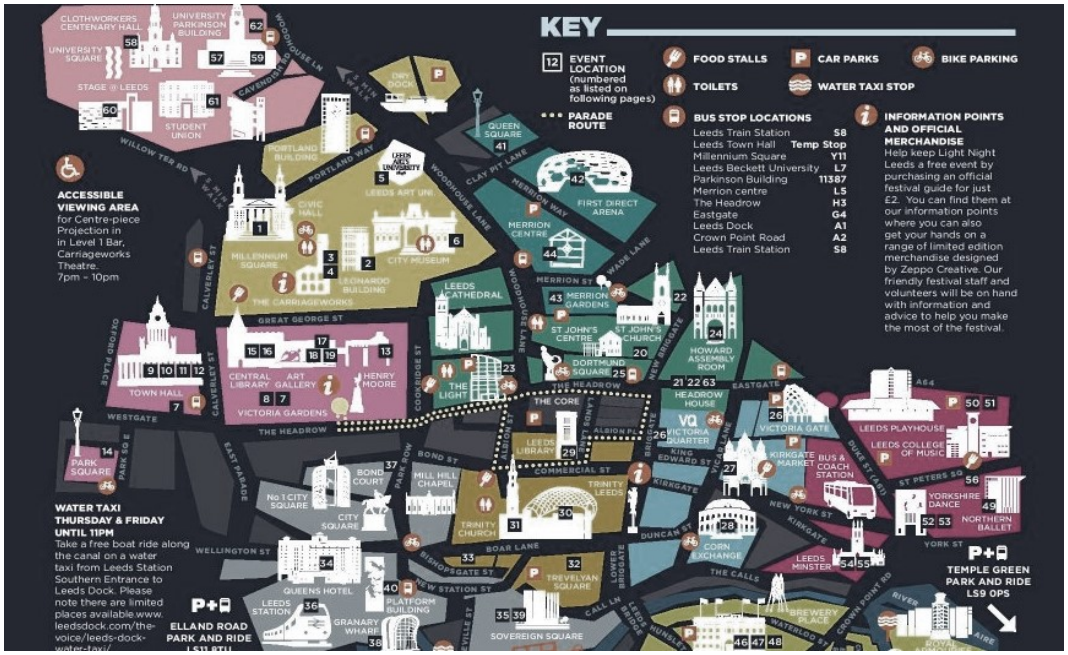


Fig. 4.3 Light Night Leeds, 2018, installations map (https://whatson.leeds.gov.uk/)

Data collection and Reflection

The pilot study which was conducted over the course of 4 days in October 2018 aims to carry out a number of different studies involving the analysis of local site and context, user's activity in public space, participants' engagement with the digital installations, main impressions and perceptions of the transformed public space and potential changes in the local urban dynamics such as user flows and duration of stay in public space.

The main data collection tools deployed to do that involved field observations and on-site discussions with both participants and event's staff (see APPENDIX A). Furthermore, although unplanned, an interview with an installation designer was also carried out on site which provided significant input and gave the opportunity to the researcher to develop a more comprehensive image on media installations effects.

Because of the high number of installations (sixty) (fig. 4.3), and time limitation it was decided that the pilot study would focus on the assessment of 4 installations depending either on the nature of the installation itself or the criticality of the location (fig. 4.4-4.7). Generally, installations placed on critical or focal points of the city, facilitated also in a variety of public space typologies were preferred.

Fig. 4.4 (left) Celestial SoundCloud by PifPaf, Trevelyan Square, Leeds, 2018
Fig. 4.5(right) Bouquet D'abat Jour (Lampshades Bouquet) by TILT, Victoria Gardens, Leeds, 2018

Fig. 4.6 Chaos by Hotaru Visual Guerrilla, Projection Mapping, Millennium Square, Leeds, 2018
Fig. 4.7 Heofon Light Maze by Ben Busche, Sovereign Square, Leeds, 2018

Brief findings and reflection:

- The population increased significantly at all the locations that accommodated digital interventions, especially the most focal ones such as the central millennium square.
- The users' duration of stay was escalated considerably, although the unpleasant weather conditions
- High numbers of users mentioned that during the event they visited various public spaces of the city that they normally wouldn't
- Digital interventions managed to transform and add livability in some isolated, quiet and unused areas such as internal courtyards
- A cheerful and vibrant atmosphere was broadly reported in all visited areas both through researcher's observations as well as through user's and installation supervisors' comments.
- A high diversity of visitor profile was reported which included various age groups, user groups which can be associated with high level of inclusion.
- People used to form close social encounters when engaging with all of the installations with both people familiar to them but also strangers. The

interaction with the installation very usually initiated various conversation and acted as a stimuli for triangulation, as discussed in chapter 4.

- Most popular installations were the ones that indicated a great level of engagement and/or immersion either in terms of installations physical articulation and scale, or in terms of modes and choices for interaction, number of senses involved or even the duration of spectacle.
- Most of the users from 18-35 and more than half of the rest age groups used to share at least one moment of their experience with digital installations on their social media accounts, most often on Instagram.
- The existence of a number of miscellaneous urban attractors, besides the media interventions, such as food stalls, temporary open-bars and dance performances during the event dates make it difficult, in some cases, to identify the actual effect of the digital intervention in space's visitation.

4.2.3 Secondary Research Study

This secondary research study mainly involved a) the review, classification and analysis of data already collected and reported in official impact reports and b) the analysis and synthesis of data extracted from social media referring directly or indirectly to user's perception of digitally enhanced public space (see Appendix B).

Pilot Study 2	
Dates	November 2018
Locations	Poole, UK
Public Space	Various types of public spaces had been selected for the accommodation of digital interventions; Main civic plaza, internal courtyards, pocket park, retail streets, waterfront promenades
Installations	15 light and sound pieces including both interactive and non-interactive installations
Methods applied and tested	Document review and digital ethnography

Table 4.3 Pilot Study 2 outline

Fig. 4.8 LightUp Poole, 2018, event leaflet with installations' description (https://lighthousepooleuk.s3.amazonaws.com/digital%20version%20LUP-DL-6pp-Leaflet-ISSUU.pdf)

Data collection and reflection

The case for this study was again a digital art and lighting event, namely Light Up Poole (fig. 4.8), and the main sources for the data were a) 2018 Project Impact Report produced by the collaborative funding initiative Audacious (fig. 4.9) and b) Instagram uploads, particularly the ones tagged with #lightuppoole hashtag (fig. 4.10). The respective data were extracted using the instagram post data extractor *Phantombuster*. Generally, the first set of data aimed to reveal the broad impact of the event in Poole city and look at aspects such as event's audience, demographics, footfall, reasons of visitation and contribution to the local economy and business. Therefore, data mainly included metrics, statistics and surveys. On the other hand, the second set of data were mainly qualitative including images and text of users' individual descriptions of their experience through the interaction with the digital interventions.

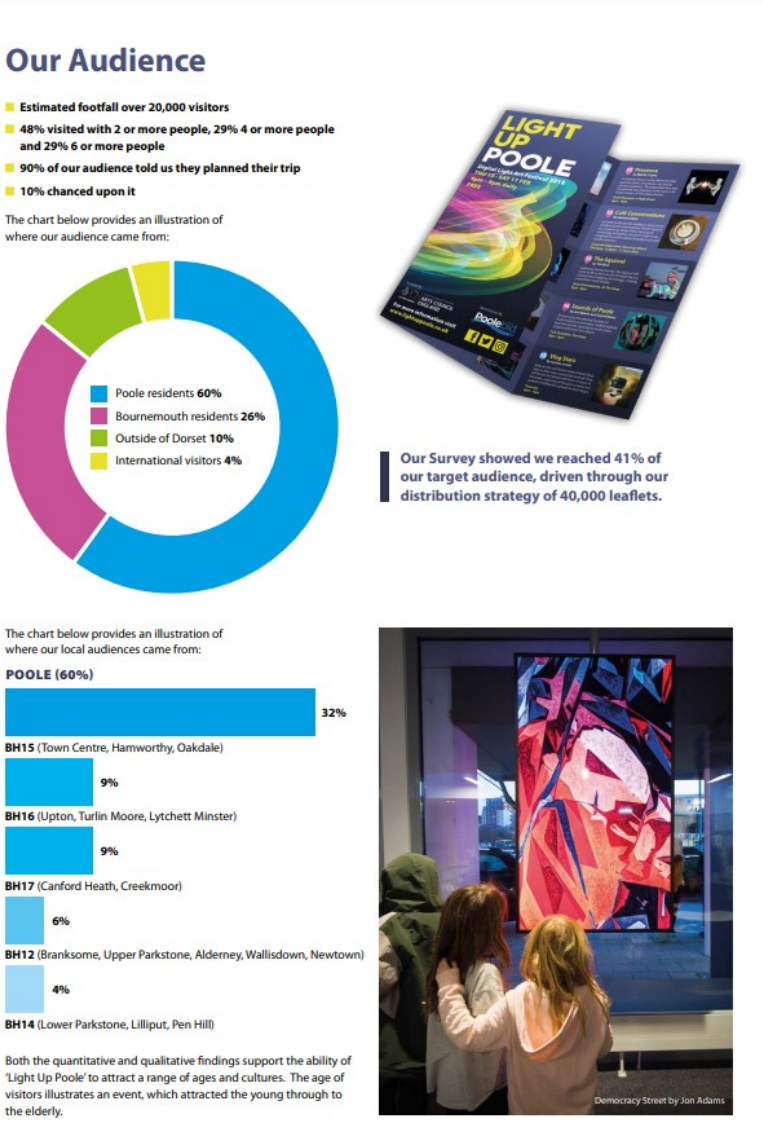


Fig. 4.9 LightUp Poole 2018, Part of project impact report (https://lightuppoole.co.uk/wp-

content/uploads/2018/08/LUP-Impact-Report.pdf)

*"'I just wanted to say that my wife and i popped along friday evening to the festival and thought it was fantastic**. It was brilliant to see so many people milling around in what is usually is a quiet part of poole on a friday night**."*

Tom, Audience Member (Audacious, 2018:3)

Fig. 4.10 LightUp Poole moments on Instagram (https://www.instagram.com/lightuppoole/)

Brief findings and Reflection:

- Main objectives of the festival, according to the curators, were to 'inspire, delight and emotionally resonate with local communities', promote city's cultural and artistic reputation, change citizens' perception and feelings about winter, promote local economic development and establish collaborations with people and organizations that encourage innovative ideas. All the aforementioned objectives **overlap with the creative and bottom-up strategy of placemaking as it clearly locates people and place experience creation as central aspects of this strategy**.
- Event's demographics affirmed what was identified in pilot study 1 in terms of user group diversity and inclusion as there was a quite homogeneous distribution of age, gender and ethnic groups.
- 90% of our audience planned their visit to engage with event's installations and activities and the major part of it was aware of the event through social media.

- The hashtags #publicart, #digitalart and #installation were the ones most commonly used as descriptions in Instagram. Descriptions and captions that could be associated with users' experience were not identified. This could be partially due to the low number of posts (n=15) included in the hashtag #LightUpPoole2018 which was assessed (see for example fig. 4.10)
- In terms of users' perceptions regarding their experience in the digitally enhanced public spaces of Poole, according to survey's data, five main themes can be identified in their descriptions:
  a) distinctiveness ('different', 'interesting', 'magical'),
  b) excitement ('exciting', 'amazing', 'fascinating', 'surprizing', 'amusing', etc.),
  c) delight ('good feeling', 'good atmoshere', 'lovely', 'cool', etc.),
  d) creativity and novelty ('creative', 'inspirational', 'talented') and
  e) inclusion ('inclusive', 'wheelchair friendly', 'accessible' etc.).

4.2.4 Considerations for Methodology

To summarise, the list that follows highlights key points that were considered for the design of the research methods:

- Necessity of **comprehensive site and context analysis**

The pilot study 1 indicated that there was a need for the researcher to be familiar with the studied context before the conduction of the main study in order to thoroughly understand the effect of the intervention on the particular setting. Therefore, it was considered necessary, prior to conducting the main field research, to undertake an initial phase of spatial and contextual analysis with several site visits and, particularly, on different days and times.

- Potentially **valuable input from contact with event's curators and local stakeholders**

Brief findings from Pilot Study 2 indicated that the main drivers for the digital re-configuration of public space in light of an urban media art event may overlap with the fundamental ideas of placemaking, as identified and analysed in chapter 3 (a. emphasis on people, b. appreciation of local context, c. promotion of adaptability and flexibility). Therefore, it was considered that a number of interviews with event's curators, local stakeholders and supporters could provide valuable input regarding their main motivations and the role of media strategies as placemaking tools.

- Need for **thorough exploration of user's emotions and psychological implications of interaction**

It was realized that interaction with media interventions induced a variety of feelings to users according to their descriptions. Therefore a supporting study that could examine more thoroughly the transformations in their psychological state by exploring their stress levels throughout repetitive interactions with digital interventions in public space could provide valuable insights in their overall perception of space and/ or its restorative potential (Al-Husain et al., 2013; Montgomery et al., 2017; Capineri et al., 2018)

- **Social media play a critical role** in both the promotion and representation of digital strategies and experiences.

Social media's role proved to be quite crucial both in terms of promotion of the urban digital events to the citizens but also as a source of information regarding people's individual perceptions of their digital experience in the city. Therefore, a supporting research method deploying tools of digital ethnography such as social media data mining was considered as relevant for this study's methodological framework (Giatsoglou et al., 2016)

4.3 Research Strategy and Methods

4.3.1 From Research Objectives to Methods

Generally, the three major aspects were considered in selecting the research methods of the study:

1) The nature of the research questions, objectives and the theoretical approach of the study itself

2) The methodology that was already applied in previous studies in the same and closely related fields

3) The insights gained from the pilot studies

Ways to study and evaluate human experience in public space and interactive environments is difficult to locate in any specific academic field or through a single research method.

The main objectives of this PhD study are threefold; first, to form a general understanding of the contextual transformations caused by the digital enhancement

of public space from a socio-demographic and spatio-physical perspective, second, to explore how these collaborative experiences may impact people's social behaviour, activities and connection through face-to-face direct interaction and third, to examine and assess people's perception of the engagement of such interactive media interventions.

Although the two first goals can be addressed by adopting ethnographic practices which assist the systematic review and detailed study of public space both as social environment as well as physical space (Venegas and Huerta, 2010), the third goal requires a more thorough investigation on the features of user's emotional, interpretative and conceptual experience with the media interventions. Therefore, the last objective demanded a rather selective approach by exploring more detailed responses associated with human's media interaction and perceived experience in the public setting.

4.3.2 Studying Place Experience in a Digitally Enhanced Environment: The introduction of an integrative evaluation framework

In qualitative research, the exploration of the essence of experience of a certain phenomenon is related to the approach of phenomenology, while when a theory emerges through the assessment of a particular set of data, that refers to grounded theory. Furthermore, the holistic view of how a certain socio-cultural group performs is associated with ethnography and, finally, the comprehensive study of a case or a bounded system refers to the approach of case study (Creswell, 1998).

As analysed in section 4.1.5, the broad research approach chosen for this research is case study in order allow the researcher to investigate the phenomenon of digital enhancement of public space comprehensively through the application of multiple methods in a real-world environment. Furthermore, as this study explores the notion of human experience in a physical urban setting which also acts as an integral part of the community (public space) it also enters the fields of both phenomenology and ethnography.

Therefore, the development of an integrative evaluation framework was required that would identify and assess the three fundamental dimensions of place experience relevant to public space setting and would, also, conceptualise these in terms of spatial, social, behavioural and psychological features. This suggests that significant aspects of human experience in public space can be associated with spatial

configuration, human flows and urban dynamics, social behaviour, individual perceptions and feelings needed to be explored through various methods. Thus, the main goal and challenge of the methodology was to integrate tools from urban studies, spatial analytics and environmental psychology to test how the application of digital interventions in public space would affect people's activity, perception and behaviour. In such way, the need for an innovative and multifaceted approach started to emerge.

As discussed in chapter 4.1.4 the research strategy of convergent parallel mixed methods has been applied in this study, mixing quantitative and qualitative data in order to provide a comprehensive analysis of the research problem. This study's methods draw mainly on three areas of inquiry in order to precisely address the research objectives: a. Ethnography, b. Phenomenology and c. Neuroscience.

a) Ethnographic methods

Main goal

One of the pioneers in applying ethnographic methods to extract information about the built environment and how this influences human experience and behaviour was W. Whyte primarily through observations, recordings and on-site interviewing (Elsheshtawy, 2015) which are mainly the fundamental tools of ethnography (Creswell, 2008). Ethnographic data can be both qualitative and quantitative; generally, quantitative studies provide numerical and statistical data on amount of population and respective variations, duration of visit, walking paces and proxemis, while qualitative data mainly involve recordings on human behaviour and activity, social interaction and overall impressions.

Particularly regarding the powerful effect of observations in uncovering people's experience in the urban setting, Palipane (2017) notes that through direct observations in the 'lived' space and its everyday interactions, an overall impression is developed on the ways people occupy space so that it becomes less necessary for them to articulate verbally their views. In a similar sense, Gehl (2016: 2018) suggests that observational methods in public space help the researchers to understand 'how people vote with their feet' and reveal use patterns among various user groups and modes.

Ultimately, ethnographic methods in this study will provide a broad image of human experience in public space from the perspective of how public life is articulated. In this regard, public life is considered as everything that takes place in the examined outdoor areas and can be observed while happening (Gehl and Svarre, 2013).

However, public life is not involving the city's level of wellbeing and citizens' psychological state; it rather refers to the "complex and versatile life that unfolds public space" (ibid: 2). Specifically, in terms of study's conceptual framework and main goals, ethnographic methods provide rich information on how digital interventions may affect the local socio-spatial context of a captain public space while also uncovering significant insights on people's social experience in public space through observing their social behaviour, encounters and/ or proxemics.

Site and context analysis

Another important contribution of ethnography in this study is that it forms the main basis for the conduction of site and context analysis which, as also mentioned in chapter 5.2.4, constitutes a very crucial step of the data collection process. That is because every individual's experience of space is greatly affected by that space's relation with the surrounding social and spatial environment. Therefore, the configuration of physical forms, paths, viewpoints as well as preferred routes, focal points and local destinations and stimuli have been proved to influence human behaviour and mediate wayfinding decisions (Montgomery et al., 2017). According to Iyer(2013: 8) site analysis is important in terms of "Defining urban patterns and characteristics that create a unique sense of place." The composition of the built form, streets and viewpoints have proved to have impact on human movement, perception and behavior in public space by opening or blocking views, by offering visual stimulation and opportunities for gradual exploration of the area, and also by regulating wayfinding conditions (Batty, 1997; Batty, 2001). In this context, ethnographic methods allowed the extraction of significant urban data in the study areas not only during the period of their digital enhancement but also during several periods of their 'normal' use.

Digital Ethnography

In the last decades, social media have emerged as a powerful source of ethnographic data providing rich information on the experiential dimensions of places aiming not to limit researchers to the physical context of their study (eg. Cox et al., 2008; Toscano, 2017; Hochman and Manovich, 2013). This process is referred to as *digital ethnography* and it practically involves the investigation of social media practices and technologies as part of ethnographic research in order to capture and assess the social, material, behavioural, perceptual and technological affordances of phenomena, spaces or initiatives.

During the conduction of the first pilot study it became apparent that a major amount of users captured and shared moments of their experiences with interactive installations in social media. At that point a new question arose: **How could the researcher utilize visualizations of data deriving from visual social media such as photos, tags, descriptions and other metadata to examine the contextual, social and perceptual patterns of digital experience in public space?**

Among other free social media applications, Instagram was deemed as the most proper source of information for this study as this channel emphasizes the quality of visual communication and the use of photographic material. Soon after its launch Instagram became one of the most popular networking platforms globally (Duggan, 2015). Being a social medium that combines visual and locative information, Instagram has been characterized as a participatory 'urban sensing system' (Lane et al., 2008). In other words, it acts as a tool for documentation and observation of the local and non-local urban dynamics and the transformations that may occur in the way people use and experience public spaces (Toscano, 2017). Photographs, videos, descriptions and locations are posted at the same time when people navigate their daily lives and the information is concentrated in the media platform. This way, Instagram **becomes a distinct information source including great amount of urban data and users' personal descriptions in multiple contexts** or, as Pink (2009) highlights, creates *'ethnographic places'* that navigate both digital and physical settings and promote collaborative, participatory, open and public procedures.

Challenges

Generally **the major challenge** of ethnographic research is the high amount of time required both for the data collection but also for the creation of a substantial rapport and understanding between the researcher and the subject/ context studied (O'Byrne, 2007; Hoholm and Araujo, 2011). Furthermore, the descriptive analysis of facts that are often represented with less scientifically require a second more rigorous and comprehensive level of analysis is required that is based on the complete and detailed sorting, organization, conceptualization, refinement and interpretation of data in order to extract reliable conclusions (Thorne, 2000). In the context of this study, the primary short-coming of ethnographic methods is the fact that although they can provide rich and comprehensive data on the overall impressions of people as well as the social and contextual affordances of digital interventions in public space, especially in regard with of public life and its potential transformations, **they are less effective in the deep exploration of personal perceptual experiences which may involve the**

psychological, affective, conceptual, interpretative and/or symbolic qualities of this kind of interventions in association with the overall lived human experience in the respective physical setting.

b) Phenomenological methods

Main goal

In that sense, it was realized that phenomenological methods can be powerful in addressing the particular shortcomings of ethnography. According to Creswell (1998:57) *"phenomenology describes the meaning for several individuals of their lived experiences of a concept or a phenomenon".* The main focus of this set of methods is to observe, analyse and interpret the effect of a phenomenon based on narratives and reports of the participants and, therefore, it is considered as a highly effective approach to the study of human experience (Wimpenny and Gass, 2000).

As analysed in section 3.1.3, certain types of digital interventions act as experiential objects (or digital *Props*) which means that they provide opportunities for direct engagement and lively experiences with them as they comprise identical structures which integrate both meaning and use. In this context, the phenomenological research methods can explore the ways people experience urban public space as a perceptual field which facilitates a number of digital experiential artefacts and what role the place plays in their action and interaction (de Certeau, 1993). Essentially, this methodological approach highlights the significance of the human individual within the process of data collection and analysis (Bloor and Wood, 2006). Furthermore, the phenomenological assessment of urban space is critical in this study for one more reason; The overall research design decided involves an embedded case study which, ultimately, means that the study area will include a broad public realm of an urban area with multiple incorporated digitally enhanced public spaces. In this context, the role of phenomenology is vital as it encourages the deep and detailed interpretation of relatively dense and enclosed spaces, rather than expansive ones (Stevens, 2006). Thus, although ethnographic methods can provide fruitful insights on the overall strategy of digital enhancement of the area and shed light on the broad affordances of each digital intervention in public space and life, phenomenological methods will aim to uncover the fundamental and complex features of human behaviour, feelings and perception in each of these spaces separately.

Phenomenological data collection methods mainly involve in-depth interviews and narratives as these form of techniques are crucial for the construction of description, understanding and interpretation of the nature and meaning of experience that the

users went through (Creswell, 1998; Wimpenny and Gass, 2000; Bloor & Wood, 2006)

Challenges

A major challenge of phenomenological methods is the selection of participants that will be involved in the study. This selection is critical as participants will be experiencing a phenomenon and then will help the development of a deep and comprehensive understanding of their lived experience and the effects of the phenomenon and finally through analysis of their inductive thoughts that would result in addressing the research questions. Another important aspect that phenomenological methods often judged on is the level of validity of their findings. That is based on the fact that phenomenology is primarily based on individual experience descriptions and often the words used among different people throughout their narratives may refer to different meanings, feelings and ideas (Giorgi, 1988; Beck et al., 1994; Bloor & Wood, 2006)

c) Experimental methods in neuroscience

Main goal

Generally, neuroscience is responsible for exploring how humans respond to sensorial environmental stimuli in order to form an understanding of the biological basis of human behaviour, perception, and consciousness (Kandel, 2012). In the urban context, neuroscience can contribute to the examination of people's sensorial input of space and its effects in terms of physical, cognitive and perceptual environmental experience. This approach clearly overlaps with the scope of this PhD study in regard to how urban experience in public space is approached. Furthermore, neuroscientific methods may discover key insights on human perceptual experience or enhance the validity of the ones drawn by the phenomenological methods by providing compelling evidence (Camargo et al., 2018)

Although this PhD study forms an integrative multidisciplinary approach, the major research impact involves the areas of urban design, planning and placemaking. Therefore, the neuroscientific approach of this study acts as a supporting research method and is comprised of a psychophysiological experiment which aims to uncover the variations of human experience throughout people's trail of digital interactions, focusing on the examination of participant's emotional state. Ultimately, this approach aims, as the phenomenological one, to reveal and assess the individual perceptual experiences of the digitally enhanced public spaces but, in this case, it seeks to create a more robust and objective understanding of participant's psychological state.

Furthermore, experimental neuroscience methods provide unique opportunities to better understand how public space can impact on users' physical and mental wellbeing, feelings of happiness and emotional attachment to locations and subsequently inform placemaking strategies (Reardon, 2017).

Chapter 5

Research Design and Execution

Following the completion of the two pilot studies, the final research methods were designed and amended. This chapter illustrates how the development of this study has contributed to integrative methodologies and pragmatic approaches in the field of human-centred urban design and placemaking, through the design and implementation of this inquiry. The chapter is divided into four main sections. The first section will justify the selection of an embedded case study as the main research approach and introduce the context of the selected case. Subsequently, the data collection methods and process will be thoroughly outlined. In the third part of this chapter the data analysis process will be explored, while the last section will outline the fundamental ethical considerations of the study.

5.1 Case Study Selection

This section introduces the case study that comprises the territory of inquiry for this research. The single site that has been selected comprising the main focus of this study is the public realm of MediaCity, UK. Particularly, four different typologies of public space within this public realm will be explored in two different states; a. during their digital enhancement by the application of various media interventions in the course of the digital art event Lightwaves 2018 and b. during their standard state without the presence of the digital interventions. This site represents diverse and co-existing qualities within the urban fabric of a context which has recently been regenerated and it still seeks to establish its new character and identities.

For Yin (2009), a research design is a logical process for getting from the starting point of “research questions” to the ending point of “research conclusions”. The decision between single or multiple case study for this research was crucial and, since it took place before any data collection, the deep understanding of each cases advantages and disadvantages was essential. Although, multiple case study is quite frequently preferred by researchers and critics due to its analytical and comparative nature, a single case study approach was deemed appropriate in this research for four main reasons:

1. The uniqueness of the urban context of MediaCity, UK. Although MediaCity seen as an urban regeneration “product” can be considered as a typical British example design-wise, the combination of the story behind the area, its direct and indirect connections to media and digital technology, its spatial context which integrates interesting artificial and natural features and the characteristic canal location made this case distinctive and valuable even as a single source of data due to its powerful relation to the study’s research question. Furthermore, the appropriateness of the digital strategy taking place in MediaCity for the temporary application of media installations (Lightwaves event) in comparison to other related strategies in UK (table 5.1) was also fundamental and is going to be explained further later.

2. As one major concern of the research was to explore deeply and holistically the phenomenon of urban experience in public space**, a pragmatic multimethod approach was decided to be applied**. In that sense, a single case would give the chance to the researcher to collect data thoroughly through each research method by doing multiple studies and by applying various data collection techniques. That would subsequently have as a result a profound and detailed examination of all the evidence

provided, an explicit assessment of the selected approaches/types of urban experience, and finally precise data triangulation and synthesis in order for a complete and integrative examination of human experience in public space to be formed. Also, according to the main research aim which is to explore the variations of human experience through trails of digital interactions in public space, multiple locations and typologies that include media installations within a broad public realm were going to be studied and compared. As a result, although the main case study in terms of spatial and temporal context is one, there would be at least three separate public space locations/ typologies accommodating installations that would be explored. Ultimately that led to the realization that a combination of multiple case studies (public realms) wouldn't be effective and suitable in terms of proper application of all different research methods and data analysis because of the excessive volume of data.

3. The particular context facilitates **one of the most suitable digital strategies to analyse in UK** context, closely related to study's main focus, in terms of content, general plan and duration.

4. The **limitation of time and cost** which was a significant factor for the conduction of the study needed also to be considered.

5.1.1 The Context of MediaCity, UK

MediaCity, UK and Salford Quays regeneration

The city of Manchester comprised a significant hub for manufacture for the UK during the industrial revolution, with the docks of Manchester Ship Canal (now Salford Quays) being the major British gateway to the world. However, along with the decline of manufacturing after the second half of the 20th century, the docks and the Salford area started deteriorating as well (fig. 5.1). In 1970s, 3000 jobs were lost and the area gradually became a wasteland. After the final closure of the docks, in 1982, Salford City Council invested on the site and an urban redevelopment started taking place under the Salford Quays Development Plan (Swinney, Piazza, 2017).

In 2006, BBC's national operations decided to partially move from London to the area of Salford Quays primarily for economic reasons. It was expected that this move would create around 15,000 new jobs in and outside BBC company, as a consequence of the new requirements of the area in terms of activities and services (Salford City Council, 2009). MediaCity UK was the outcome of a 200-acre mixed-use property development (fig. 5.2) scheme which started in 2007 as part of the general regeneration and rebranding of the former Manchester docks, which were then

renamed Salford Quays. The area gradually transformed into a digital hub for media companies with some of the main occupiers, besides BBC, being ITV, SIS, The Landing and the department of Media of the University of Salford (http://www.mediacityuk.com).

Fig. 5.1 (left) Aerial view of Manchester Docks in 1963 (University of Salford Press Office Source: https://www.manchestereveningnews.co.uk)

Fig. 5.2 (right) MediaCity UK, 2017 (University of Salford Press Office Source: https://www.manchestereveningnews.co.uk)

5.1.2 LightWaves Festival

Lightwaves is one of the largest digital events in UK, taking place every winter in the area of Salford Quays. The event is often comprised of the application of 10-15 media installations, majorly new every year, located in several locations and mainly outdoors. Aim of the event, according to its curators and the city council, is to animate and activate Salford Quays's public space and to bring people close to creative digital light art.

Every year in December, new and exclusively designed digital installations are applied onto relatively "strategic" points of public space, giving the opportunity to the pedestrians to go through a series of digital experiences by interacting with different installations. At the same time light art workshops and talks take place mainly in weekends. According to event's *curators "Lightwaves aims to bring people out of their houses, bring diverse audiences together and to infuse with light and art cold and dark winter nights"* (Interview with Quays Culture, 2019 [C1]; http://thequays.org.uk, 2018).

Digital events and strategies in UK

Strategy	Location	Month, Duration and Size	Admission
Leeds Light Night	Leeds	October, 2 days, 50-60 installations	Free
Light Up Lancaster	Lancaster	November, 2 days, 15-20 installations	Free
Lumiere Durham	Durham	November, 4 days, 20-25 installations	Free
Lumiere London	London	January, 3 days, 40-45 installations	Free
Blackpool Illuminations	Blackpool	September-November, 15-20 (mainly illuminations)	Free
Enchanted Parks	Newcastle	December, 6 days, 15-20 installations	Ticketed
Submerge	Bristol	March, 11 days, 4-5 immersive experiences(art) +performances, workshops, cinema, music, talks	Ticketed
Light Up Poole	Poole	3 days, February, 25-30 installations	Free
Light Night Nottingham	Nottingham	1 day, February, 7-10 installations	Free
LightWaves	Salford Quays	10 days, 10-15 installations	Free

Table 5.1 Digital art and light events in UK

Digital and light art initiatives are gradually becoming more and more popular in UK recently, taking place mostly during the winter (table 5.1). After an extensive review of them it was concluded that Submerge event in Bristol and Lightwaves in Salford Quays were the two most proper cases to study and a main reason for that was their duration. The rest of the events have a three day duration on average something that would not allow the application of all the intended research methods during the field work. Eventually, Lightwaves event was selected as the most proper digital strategy for two reasons:

a) Because that *event is free* so the interaction with the digital installation by the users would be spontaneous, accidental, probably unplanned, uncontrolled and seamless; important aspects that are in line with the fundamental ideological framework of the study.

b) Lightwaves event was one of the few events that was *based purely and strictly on the exhibition of digital installations*. That means that it does not facilitate any other marketing/ people attracting activities such as dance and/or music performances, public talks, shows, food stalls or any other crowd-drawing initiatives that are usually

applied during events. That fact was critical *as the central aim of the research is not to explore the phenomenon of urban events and festivals, but the phenomenon of the temporary application of digital interventions in public space*. Therefore, although Lightwaves is technically considered as an event, it is essentially a tactical urban strategy for the temporary application of media installations in public space without consisting of any other gestures that may influence the standard urban dynamics and activity (total population, human encounters, flows, destinations, duration of stay, etc.).

5.1.3 Public Space Typologies

a) The Plaza

MediaCity Piazza constitutes an almost 4000 m^2 part of MediaCity's public realm forming the central plaza area located in front of the BBC Studios. It faces the waterfront area and it is mainly surrounded by the BBC facilities such as the BBC Bridge House and the BBC Quay House (table 5.2). According to Salford City Council the plaza has been designed to accommodate 5000 people and therefore it is ultimately considered as an important spatial focal point for MediaCity's development. Furthermore, its open space, size and gentle slope are intended to provide flexibility and comfort for the hosting of various events (https://www.salford.gov.uk/mediacityuk/). In terms of landscape, the piazza incorporates a number of resin bound footpaths, granite planters and an array of large semi-mature trees (https://www.idverde.co.uk). Finally, its north-east part very often provides space for tactical interventions and functions such as food trucks, open bars and artworks.

b) The Gardens

This part of MediaCity's public realm is adjacent to the cenral piazza and consists several pocket green spaces with ornamental planting, resin paths, lawns and dividing walls (https://www.idverde.co.uk/portfolio/media-city-external-landscaping/). It can be considered as the main area of softscape in the development and it overall covers an area of approximately 5500 m^2. It is adjacent with the main restaurant and café strip of the area and it is also in direct proximity to the facilities of the university of Salford (table 5.2). Generally, in terms of scale, materiality and articulation it can be considered as a more welcoming and compact section of green which sits in contrast to the excessively open and concrete space of Piazza.

c) The Enclosed Square

This public space is comprised of the retail and leisure square in front of the Lowry Theatre. That is a focal point of the area as this building complex forms the main part of recreational and cultural activity of the area by incorporating theatres, galleries, performance spaces, shops and conference facilities. The Lowry square is also surrounded by the Lowry Outlet Mall which is also a space which facilitates a number of shops, cinemas as well as cafes, bars and restaurants (table 5.2). Besides the intense human activity due to the uses of this quarter, the square also constitutes an important spatial focal point of the area as it is connected with two pedestrian bridges; the north bridge connects the square to the main area of MediaCity and the South one connects it with the area of Trafford.

d) Waterfront Promenade

The waterfront promenade mainly refers to a 500 m linear hardscape configuration at the canal edge which ingrates several additional design features such as planting, stairs and viewing points, having although as a main focus the circulation by and the emphasis on the canal side and the water element (table 5.2). Functionally, the waterfront promenade also connects the main public realm of MediaCity with the residential area which covers the east part of the development.

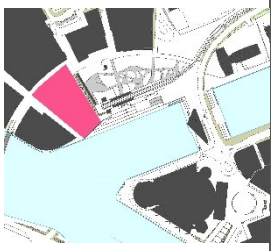
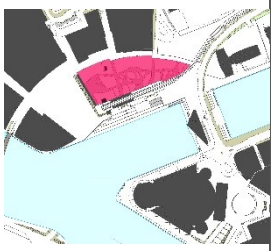
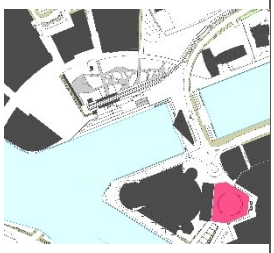
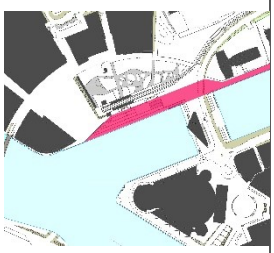
Case Study Unit			Public space Typology and Key facts
The Piazza			*Public events square* 4000 m^2 open space Not very intense human activity No mix of uses
The Gardens			*Pocket park* Softscape and greenery Frequent people flows Close to café-restaurant strip and University of Salford
The Enclosed Square			*Leisure and retail square* Enclosure Diversity of recreational, retail and cultural activities Focal point
The Waterfront Promenade			*Promenade* Concrete pathway and landscape configurations, Relationship with water element Emphasis on the canal and viewpoints

Table 5.2 Case Study units and main features

5.2 Data Collection Methods and Process

According to Friedman et al. (1978), in the majority of evaluation studies, multi-source data gathering is utilized. As also discussed in the previous chapter, the converging strategy allows for the strengths of one technique or method to address the weakness of another. Friedman et al. (ibid), also, believe that a set of data is considered as reliable when consistent in at least two ways. Furthermore, as seen before, the versatile nature of built environment research and evaluation suggests the application of multiple research techniques (Down and Stea from Shamsuddin, 1999). Especially in terms of the case study approach, Yin (2009) suggests the data collection stage should include a case study protocol, involving various evidence sources and forming case study database to maintain a chain of evidence. This chain of evidence is also referred to as 'audit trail' and it is crucial for drawing conclusions (Miles & Huberman, 1994).

Therefore, based on study's theoretical and conceptual framework as well as on methodologies applied on previous research projects in relevant areas, it was decided that this study will follow a pragmatic approach employing mixed methods and several data collection techniques. This sub-section discusses in detail the data collection techniques deployed. As introduced previously, qualitative and quantitative techniques have been utilized to conduct the inquiry of this research such as various types of ethnographic studies, semi-structured and in-depth interviews, a psychophysiological experiment in the field as well as some digital ethnography through mining data from social media (table 5.9). The overarching aim is to uncover the affordances of digital intervention in all aspects of place experience, namely spatio-contextual, social and perceptual, and to investigate their potential contribution in the practice of placemaking. The overall structure of the data collection process explaining the main objective of each technique is summarized in table 5.9.

5.2.1 Site and Context Analysis

The understanding of the relationship between the study area and its surrounding context was fundamental for this research. Human's perception and experience of space is highly affected by that space's relation to its surrounding environment (Montgomery et al., 2017). According to Iyer(2013: 8) site analysis is important in terms of *"Defining urban patterns and characteristics that create a unique sense of place".* The composition of the built form, streets and viewpoints have proved to have impact on human movement, perception and behavior in public space by opening or

blocking views, by offering visual stimulation and opportunities for gradual exploration of the area, and also by regulating wayfinding conditions (Batty, 1997; Batty, 2001).

Ethnographic studies, which also include studies of site and context analysis, were conducted at the same public spaces when the installations were not present. In this case, the data collection process was structured both so as to replicate the original circumstances, with respect to the days of the week, time of the day and weather conditions, but also so as to explore the performance of these public spaces in different seasons of the year in order to identify the potential effect of the weather. This additional set of evidence is crucial because it allows an evaluation of the intervention's role in the transformation of place experience and also a comparison with different periods of the year when public spaces normally tend to be more vibrant. Through a comparison of all different conditions, it was possible to examine the impact of the digital installations over the liveliness and sociability of the spaces and this, consequently, permitted an evaluation of the digital intervention's role in the placemaking process.

Site analysis for this study mainly focused on the experiential aspects of space, therefore it primarily consists of (see also Appendix C):

- Urban morphology analysis (Gauthier & Gilliland, 2006; Marshall, 2015); figure ground, building heights and enclosure, type of edges, street patterns (Llewelyn-Davies, 2000; Iyer, 2013)
- Walk through analysis; Evaluation of the urban qualities and design challenges perceived by walking through the area, making observations and recording impressions (Iyer, 2013; Criestensia et al., 2018)
- Human movement analysis (Gehl, 1989/2013; Vroman and Lagrange, 2017)

Data Collection	**Site and Context Analysis**
Process	Urban morphology analysis, walk-through analysis, human movement analysis
Visits	1 weekday visit (October 2018), 1 weekend visit (November 2018), 1 weekend visit for further data collection and triangulation/ cross examination (February 2019), 1 weekday visit for further data collection and triangulation/ cross examination (March 2019)
Main aspects studied	Urban fabric, public spaces layout, building forms, level of activity of edges, figure ground, enclosure, functions, pedestrian circulation, focal points

Table 5.3 Site and Context analysis process outline

5.2.2 Ethnographic Observations and On-site Discussions

a) Direct observations, time- lapse photography, video ethnography

According to Lynch and Hack (1984), ethnographic observations are more successful when the activities, movements or behaviors of interest are mainly pre-determined. This is suggested to avoid the collection of high amount of unreliable or unnecessary data, with minor or no relevance to the research questions, and to promote an efficient and focused process. Through targeted observation conducted at frequent intervals, patterns and models can be identified.

In this study the selected themes of observation are:

1) Population, encounters and static activities (see Appendix D)
2) Pedestrian flows and Walking Patterns (see Appendix D)

Studying the walking patterns

The last twenty years have seen a dramatic rise in the empirical investigation of the links between built environmental perception and walking pace and patterns as well as its implications on physical activity in general (Saelens and Handy, 2008). Gehl and Svarre (2013) , for example, through their field studies found that people tend to walk faster when passing less active and attractive areas, whereas in lively and more sensory pleasant environments urban spaces they tend to have a slower pace.

Similarly, Costal et al. (2015) note that walking speed and perception of the surrounding environment are interrelated. When a person moves fast les environmental details and information are perceived while when their slow down they are able to process more information and pay more attention to their surrounding.

In a similar sense but from a phenomenological perspective, Wunderlich (2008: 125) states:

> *"it is while walking that we sensorily and reflectively interact with the urban environment, firming up our relationship with urban places."*

In light of this, scholars and urban design guidelines provide recommended walking speeds that indicate pleasant perceptual experience of the urban environment. For Gehl (2010) the optimal human walking speed is 5 km/h, for the Design Manual for Roads and Bridges(2016) is 5.04 km/h (1.4 m/s), while for Transport for London (2010) in the PTAL methodology the speed recommended is 4.8 km/h (1.33 m/s). Gehl (2010) also points out that people need to receive stimuli at eye level every four seconds when walking in the city in order to remain engaged with it.

> *"Human is a small, sensitive and slow creature with a speed of 5km/h"*
>
> *Gehl (2010: 20)*

This study, building upon Wunderlich's (2008) approach on the three fundamental human walking patterns in the city (purposive, discursive and conceptual|), explored and classified users' walking according to two main patterns:

a. Purposive- This type is characterized by fast walking speed and minimal engagement with the environment. Essentially, it forms a sort of necessary movement
b. Engaging- This type is characterized by slower walking pace and has a more explorative character. User engages more with the surrounding environment seeming to be more 'present' and interested to it.

Video Ethnography and Time-lapse Photography

Whyte (1980) and PPS and later Gehl are some of the pioneers in the use of time lapse photography and video ethnography to analyse human behaviour in public space with quite innovative findings. By filming the same sites from similar angles and then by carefully comparing the captured behaviour they came up with some interesting results. As a result, photographing and filming are, now, considered as

essential tools in public life studies to record situations where urban life and built environment interact or fail to interact after certain strategies have been applied (Gehl and Svarre, 2013).

Time-lapse photography and videos have been applied in this study to capture and analyse in further detail and real time aspects of individual bodily engagement with media interventions, people's facial expressions as indicators of their perceptual emotional experience and evidence of social behaviour such as instant discussions with strangers or even non-verbal communication with them; All aforementioned aspects constitute more 'indirect' and advanced aspects of human behaviour which require more careful assessment and cannot take place completely during the field observations. Therefore, a thorough video and image analysis enables the identification of critical patterns of actions taking place with and around the installations. Furthermore, films and photographs have been utilized as tools for documentation of the site before during and after the application of the digital installations.

To collect the necessary data from the site area, field visits were conducted as following:

Date of Visit	Purpose
23.10.2018	Site identification
30.11-1.12.2018	Data Collection for the conduction site analysis
7.12-16.12.2018	Main field visit. Data collection for the site with installations
23.2-25.2.2019	Further data collection in the area without the installations; more targeted observations according to initial reflections and discussions with local users
11.03.2019	Further data collection in the area without the installations, including mainly discussions with users on their views on the area

Table 5.4 Fields visits for ethnographic data collection

Data Collection	**Direct Observations**		**Time-lapse photography and video ethnography**	
	With Installations	Without Installations	With Installations	Without Installations
Number of people observed	Around 600/day	Around 200/day	Around 600/day	Around 200/day
Time Intervals	**15 minutes** at each public space typology repeated every 1 hour	**15 minutes** at each public space typology repeated every 1 hour	**15 minutes** at each public space typology repeated every 1 hour	**15 minutes** at each public space typology repeated every 1 hour
Main aspects studied	-Population -User profile -People flows -Walking patterns (pace, direction, engagement with environment)	-Population -User profile -People flows -Walking patterns (pace, direction, engagement with environment)	-Proximity/distance of interpersonal transactions -Type and level of engagement with installation	-Proximity/distance of interpersonal transactions -Type and level of engagement with installation

Table 5.5 Summary of Ethnographic observations data collection processes

b) On-site discussions and brief walking interviews

In terms of ethnographic methods, additionally to field observations, Lynch and Hack (1984) suggest also on-site discussions with users. According to them, asking people directly about their 'inner experience' or how they feel, their impressions, perspectives and values' that may influence their behavior can prove to be extremely valuable for the researcher by providing rich data about people and connections to their surroundings creating, in this way, a link between phenomenological and ethnographic approaches.

Walking interviews as on-site discussions are a type of "place responsive methods" (Lynch and Mannion, 2016) or a phenomenological research method related to sensorial features of personal experience and Placemaking (Pink, 2007).

In the current research these discussions aimed to uncover the emotional state of the users ad their impressions of the site, in both cases (with and without the installations) through questions that would focus on aspects such as people's feelings about the place, their place experience though the interaction with installations, advantages/disadvantages of the area, opportunities as well as their level of willingness to communicate with other people. Especially regarding their perceptual experience of the digitally enhanced public spaces questions aimed to uncover features such as users' level of motivation or discouragement to interact with installations and which of them, ways they learnt how to interact with them and personal preferences regarding the design, scale and function of the interventions. All interviews were audio recorded, and additional notes were taken on-site (see Appendix D).

5.2.3 Semi-structured and In-depth Interviews

Interviews is one of the primary data collection method of this study, also directly linked to the phenomenological approach of inquiry (Giorgi, 1997). In terms of interviewee selection, as Flick (1998: 53) points out, the main criterion should be participant's relevance to research topic "rather than their representativeness which determines the ways in which the people to be studied are selected". Accordingly, the participant selection was conducted based on their expertise, familiarity and/or level of involvement with the subject of study either both from the perspective of digital interventions, as well as from the perspective of human experience and placemaking (table 5.6).

a) Semi-structured Interviews with stakeholders, designers, research experts and event's staff

Semi-structured interviews mostly follow topic guides which involve main questions that are repeated in every interview within the same interviewee profile, although the order of questions and the level of probing may vary. Semi-structured interviews were scheduled to take place after the field studies, in order to focus on the further investigation of some initial themes and patterns identified. Targeted participants for this type of interviews included: a. people and organizations involved in organizing and supporting the digital event in order to reveal their main motivations for that and subsequently assess any potential links with the strategy of placemaking; b. digital art designers whose artworks where applied in the studied public space to explore their main concepts, drivers and, essentially, what they wanted to achieve through their artwork, both in terms of user interaction but also in terms of a creative message,

and especially examine any conceptual relationship with its surrounding space and people; c. experts from various fields such as psychology, neuroscience, play therapy, HCI as well as built environment designers in order to form a versatile and holistic set of perspectives regarding the effect of digital interventions on human urban experience.

Another set of semi-structured interviews took place also on-site during the main field studies and involved interviewing digital event's staff and primarily people supervising the digital installations. Their insights and input were considered invaluable as these people acted as constant observers of the area and particularly of the media installation and people's engagement with it. Furthermore, as installation supervisors' schedule included the hourly change of installation supervised, they had also formed a holistic and comparative view concerning all the media interventions as well as the overall effect as a digital strategy. Moreover, as all of the interviewed staff were people familiar with the context of media city and Salford quays they were also able to provide interesting insights regarding the effect of the digital interventions on the overall performance and vibrancy of all the studied public spaces through comparing the before and after situations.

b) In depth Phenomenological interviews with participants

In-depth interview has been described as , *'… a specific type of in-depth interviewing grounded in the theoretical tradition of phenomenology'* (Marshall & Rossman, 1995: 82). The association with the approach of phenomenology is based on the fact that this type of interview aims to form a more deep, rich and detailed understanding of the phenomenon studied. In in-depth interview the experience, feelings, impressions and behavior of the participant are explored and probed in order to discover any overarching concepts or themes that the researcher investigates that will allow them to structure a theory or draw conclusions regarding the respective topic (Boyce and Neale, 2006).

This type of interviews allows interviewees to communicate their thoughts and experiences more freely and spontaneously, offering richer descriptions in comparison to semi-structured interviews. Such interviews are more open, allowing more space for dialogue between the researcher and the interviewee and, therefore, establishing more *empathy*. In this type of interview, the researcher is able to amend the questions according to the responses obtained (Smith and Osborn, 2008). Thus, this form of phenomenological interviews was selected to take place with users of the

digital interventions in order to uncover features from their lived experience through mainly a perceptual and social behavioral perspective.

Data Collection	**Semi-structured Interviews**	**In-depth Interviews**	**Street Interviews-Discussions**	
			With Installations	Without Installations
Number of Participants	16	**6**	65	41
Participant Profile	Staff (4) Local worker (1) Designers (4) Curators (1) Stakeholders (1) Experts (5) (see also Appendix E)	Experiment Participants (see also Appendix E)	Users	
Main focus of Interview	-Views on potential contribution to Placemaking -Community benefits, identity building -Perceptual experiences	Perceptual Experience	Perspectives on social activity, perceptual experience and public life	

Table 5.6 The Summary of Data Collection for Interviews

The aforementioned data collection methods which mainly include ethnographic studies and interviews, according to Given (2008), have strengths that are enhanced when applied in combination in a research study and, thus, they form the set of primary data collection methods of this research. Particularly, they are considered as the primary methods of data collection for three basic reasons: a. They comprise a combination of the most commonly applied data collection methods in urban and built environment studies, b. The volume and diversity of data provided by them, which are already sufficient for quite comprehensive analysis, discussion and drawing of fundamental conclusions and c. the level of familiarity of the author in planning and applying such methods due to her academic background in architectural studies.

5.2.4 A Field-based Psychophysiological Experiment

Supporting Methods

The supporting methods were deployed both in order to triangulate initial patterns identified from data collected from the primary methods, as well to further examine some more complex and detailed aspects of human experience in order to gain a fuller view of the phenomenon.

Neuroscience, City and Placemaking

Camargo et al. (2012:8) define neuroscience as "a multidisciplinary branch of biology and is the scientific study of the brain and nervous system, including its interaction with the other parts of the body". According to them, neuroscience can aid the Placemaking process by understanding how people form their personal and collective experiences in the city, from a broad variety of perspectives (ibid).

Research in various academic fields agree that physical environment, both indoor and outdoor, can have critical effect in people from the perspective of their mental and emotional state, cognitive performance and development and general wellbeing (Gifford, 2007; Thwaites et al., 2017; Anderson et al., 2017). In this context, neuroscience studies for cities and public space aim to identify novel ways to understand and interpret human experience in the built environment, uncovering advanced opportunities for innovation, enhanced experiences resulting in turn in improved sense of wellbeing, attraction, productivity and overall performance. Furthermore, neuroscience can contribute to the identification of the environmental stressors having the greatest mental, psychological and physical impact on citizen's life, even a slight reduction of which can make crucial improvement in people's quality of life (ibid).

There are several types or scales of neuroscience ranging from practices of cognitive psychology to the studies of individual brain cells. Each different type assesses different factors of human brain function and, therefore, provides different perspectives of how human perceive, react and are influenced by their surrounding environment (Shulman, 2013)

Neuroscience in Action

The majority of research studies in psychology of place and human spatial preferences have taken place in laboratory environments where participants are

asked to view and respond to a scene they often look at for the first time. What is much rarer but emerging lately, is psychological research that takes place in real time at the field where people's mood, feelings, thoughts and even physiology are monitored at the exact time when they experience the spatial setting, so that the researcher can realize how the respective environment affects psychology during the dynamically evolving process of urban experience (Ellard and Montgomery, 2013).

The tools that neuroscience can provide for this real-time field assessment of human experience vary. A significant tool is mobile electroencephalography (EEG) which has recently evolved from a pure laboratorial to equipment to wearable 'headsets' that study participants can use while navigating urban environments (Karandinou and Turner, 2017). Mobile EEG and other wearable devices designed to evaluate brain activity and nervous system responses, such as skin conductance and heart rate, can be applied to realize how individuals experience an urban setting. Particularly, skin conductance response (SCR) being a part of the wider set of Electrodermal activity (EDA) is a commonly studied indicator of psychological arousal with recognized psychophysiological effects; furthermore, its relationship with particular brain areas has also been established (Critchley, Elliott, Mathias, & Dolan, 2000) (see also Appendix F).

The Field Experiment

The neuroscientific approach of this study comprised of a psychophysiological experiment which aimed to uncover the variations of human experience through the trail of digital interactions, focusing on the examination of participant's emotional state. The experiment consisted of two parts:

a) The psychological one which aimed to identify user's emotions and feelings through the completion of a series of psychometric tests. Particularly, it included:

Psychometric tests which measured participant's mood by using the Short version of the UWIST Mood Adjective Checklist (Roe and Aspinall, 2011), The UMACL measures three mood aspects (see also Appendix F):

- Energetic arousal
- Tense arousal (i.e stress)
- Hedonic tone (i.e. happiness)

The UMACL has a total of twelve questions, four questions for each of the three moods; subjects respond to a four-point Likert scale for each question (ranging from 'definitely', 'slightly', 'not much', 'definitely not').

Furthermore, these tests aimed to uncover facts from users' experience in the area in terms of its:

- Restorativeness

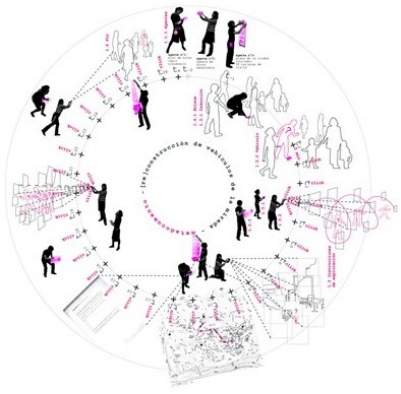
We used two metrics from a standard perceived restorativeness scale comprising the core components of psychological restoration (Silveirinha de Oliveira et al., 2013).

- Welcomeness and Safety
- Sociability
- Usability of installations

b) Physiological Data- Skin Conductivity

As discussed previously, space and its design influence our physiology. An individual's heart rate, skin temperature and, skin conductivity are indicators of psychological arousal and mood change (Boucsein, 1992). **Particularly, skin conductivity is the situation when the skin becomes briefly a better electricity conductor and is related to various stimuli (Fere, 1988). These measurements can provide very valuable insights when compared with self-reported state of mood and well-being by the users (Montgomery et al., 2017).** In this study, physiological data were measured using *Microsoft Band 2*. These wristbands contain a variety of sensors checking and gathering data from various parts and functions of human physiology which are also signs of physiological well-being like: GSR (galvanic skin response), HRV (heart rate variability), ST (skin temperature) and HR (heart rate).

The process



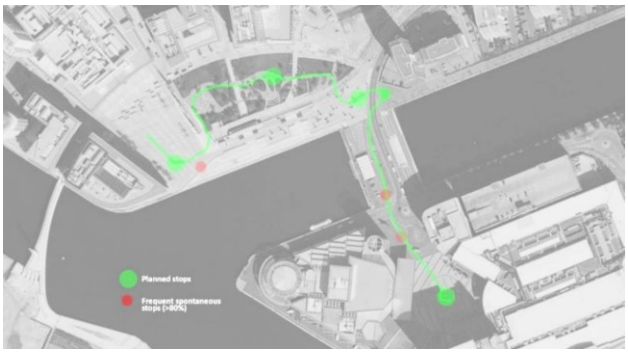


Fig 5.3 Various forms of engagement throughout participants' journey of interaction with different digital installations (adapted from www.pinterest.com)

Fig. 5.4 Route and stops of field experiment across the site area

Twenty participants were recruited to participate in this study. The tour proceeded at a slow walking pace, interrupted by five-minute rests at the 4 test sites (fig. 5.3, 5.4, 5.6; table 5.7). During the stops the participants engaged with the located installations at the level of their preference. At the end of each stop psychometric tests were completed. During the whole process, which lasted around 40 minutes, physiological data were also collected from ten of them in high frequency (3/sec, 700Hz). To measure physiological data Microsoft Bands were used (fig. 5.5). These bracelets, worn around the wrist, measure four main indicators of physiological wellbeing: Galvanic Skin Response (GSR), Heart Rate Variability (HRV), Heart Rate, and Skin Temperature, although the main focus was on data collected by GSR sensor.

Fig. 5.5 (left) Appying the sensor to the participant before the start of the experiment
Fig. 5.6 (right) Participants engaging with installations during the field experiment

To address concerns about order effects (the varying psychological effect created by the order in which people experience a change), two tour patterns were created for the experiment. A)Beginning from The Lowry Square (10 participants) and B)Beginning from BBC square (10 participants).

Data Collection	**Self-reported emotional experience**	**Physiological data**
Number of participants	20	10 (/20)
Main aspects studied	Energetic arousal Tense arousal (i.e stress) Hedonic tone (i.e. happiness) Welcomeness of space, potential for social activity, sense of safety, restorativeness, usability of located installation	Tense arousal and emotional reactions (Change in Emotional State according to environmental stimuli)

Table 5.7 Psychophysiological experiment data collection summary

5.2.5 Mining Instagram Data

In today's digitally connected world, space and urban perception are often interpreted within a context of what sociologist M. Castell would refer to as 'space of flows' (1996) or Z. Bauman's 'liquid times' (2000). The condition of the digital communication of various types of experiences has been also described as 'telesthesia' and it, essentially, involves the movement of information and ideas which happens faster than people's or objects' physical movement 'to bring what is distant near, and make what is distant a site of action' (Wark, 2012). Consequently, the emerging field of *Social Media Analytics* which focuses on the integration, extension and adaption of various methods for the analysis of social media data (Stieglitz et al., 2014) is now gaining significant attention and recognition in academic research.

This study's analysis of Instagram posts in no way aimed to evaluate their artistic value. On the contrary, it was used solely as a tool for documentation, or an additional way of observation of urban dynamics and transformations taking place in the area. Particularly, Instagram data and metadata analysis has been used as a supporting method to measure the experience of people in the selected public spaces. The ultimate goal of this method is to reveal human perception of the media interventions in the public space of MediaCity, UK, through the analysis, sythesis and mapping of Instagram data. To do that, Instagram data was extracted, particularly those including the hashtag *#LightWaves2018* (table 5.8), and subsequently the images were classified according to their content as well as the content of their respective captions

and comments and also the number of likes (see Appendix G). A thorough analysis and classification of the content of these hundreds of images can allow the author to better understand which installations attract more people according to their user/ age profile, what drives their occupation time at each space and what type of experiences are these digitally enhanced spaces triggering, both in terms of social interaction and activity but also in terms of personal perceptions and interpretations.

Data Collection	**Mapping and analysing Instagram Data**
Data Source	#LightWaves2018
Number of posts	875 images (203 miscellaneous)
Main aspects studied	Atmosphere and message conveyed through photos Most popular installations Emotional connections and descriptions for the overall spatial context

Table 5.8 Summary of data extracted from Instagram

The key dimension examined through this method is related to the way in which people use Instagram to represent their experience and themselves while engaging with the media installations. The main aspects investigated involve: a. the kind of atmosphere and message conveyed through images and their descriptions by users through Instagram and which installations seemed to be more popular/ influential to them; b. the emotional connections that people represent with the overall context of public space in light of their digital experience.

Research Technique	Aspect
Site and context analysis Observations On-site discussions Semi-structured interviews	• Contextual transformation • Public life and social activity • Placemaking potential
In depth phenomenological interview Mining Instagram data Psychophysiological experiment	• Social behaviour • Perceptual experience • Affective/

Table 5.9 Structure of the data collection

5.2.6 Triangulation

According to various authors (see for example Silverman, 1999; Aldridge and Levine, 2001; Denzin and Lincoln, 2005; Scott, 2007) triangulation is a strategy to encourage reliability and validity throughout the data collection and analysis process. Generally, triangulation refers to the comparison of various sources of evidence in order to identify the precision of information of phenomena and it is considered to add richness and depth to a research study (Coleman and Briggs, 2002).

Particularly, triangulation has been defined *as 'a methodological approach that contributes to the validity of research results when multiple methods, sources, theories, and/or investigators are employed'* (Farmer et al., 2006: 377). Triangulation is critical for this study due to its pragmatic mixed method approach for the coordination and validation of research data and findings (O'Cathain et al., 2010). The overall goal of this process is to improve understanding and rigour of the study through the detection of convergence, inconsistency or contradiction between various results and also by developing a 'complementary extension' (Snape and Spencer, 2003: 22).

In this regard, data from the site and context analysis, field observations and on-site discussions were cross related to provide answers for the spatio-contextual situation of the site with as well as without the digital interventions, the quality and intensity of the public life and social activity. Besides, these findings were synthesized with data from the semi-structured interviews with stakeholders, designers and professionals in

order to investigate the potential role of this digital initiative to be part of an integrative placemaking strategy. The findings established were used to identify the factors that affect the level of popularity and success of a digital intervention. These data and initial findings were then triangulated with evidence gathered from in-depth phenomenological interviews, the psychophysiological experiment and Instagram data to identify and discuss the final findings regarding the key features that form place experience in a digitally enhanced public space through a contextual, social and perceptual perspective. The triangulation process employed in this research is summarised in Figure 5.7.

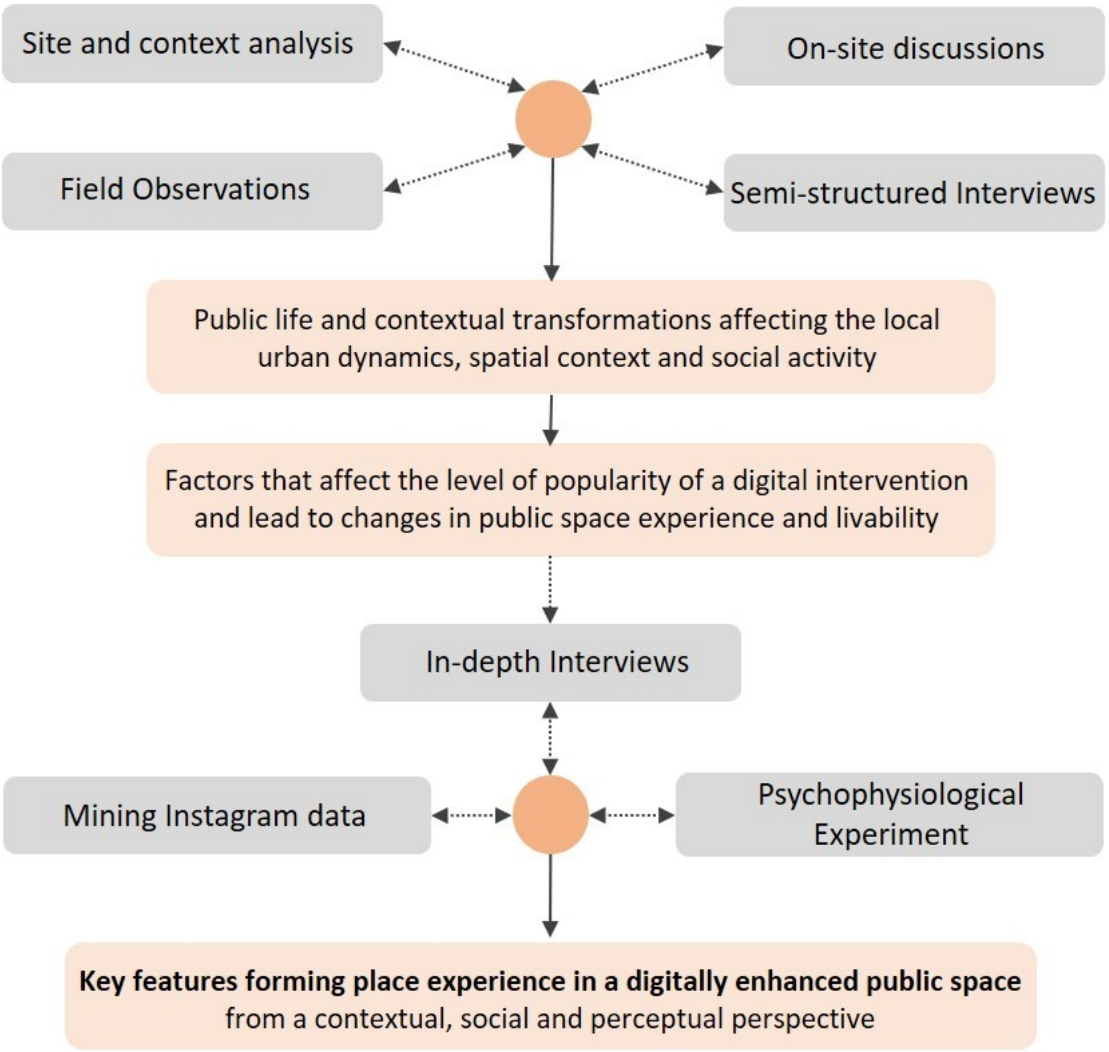


Fig. 5.7 Triangulation process in this research

5.2.7 Cross analysis

Cross-case analysis is a process of in-depth exploration and organisation of insights deriving from individual case studies or different units from a case study. At a first level, it involves the accumulation of all case study evidence while subsequently this evidence is compared and contrasted so that the researcher will be able to assess the similarities and differences across the different cases and enhance the generalizability and theoretical prediction of their study (Khan & VanWynsberghe, 2008). The central questions when conducting cross case analysis comprise the following (Ayres et al., 2003):

- What patterns emerge when assessing the within- case study evidence?
- What links arise among common themes?

During this process, the researcher seeks to develop abstractions across cases" (Merriam, 1998:195) and "a general explanation that fits each of the individual cases, even though the cases will vary in their details" (Yin, 1994: 112).

According to Baxter and Jack (2008) an embedded case study design illustrates the importance of a case through analysis "within the subunits separately (within case analysis), between the different subunits (between case analysis) or across all of the subunits (cross-case analysis)" (ibid: 550). By adopting an embedded multiple case study design, the consideration of this nested context was allowed in the exploration of various public spaces in the broader setting of MediaCity's UK public realm. Therefore, following the completion of the within-unit (case) analysis which focused on each public space separately, a cross-unit (case) analysis was carried out so that the researcher could compare results among cases.

The cross-case analytical approach of this study is comprised of two levels of comparative assessment: a. the comparison between the four units of case study (four different public space typologies within MediaCity UK public realm); but also b. the before- after comparison which refers to the transformations of public realm experience after the application of the digital interventions. Regarding the first level of cross-evaluation, which involves the comparison among separate case units, the aim of the method is to classify into clusters of groups the findings that share common patterns, configurations or theoretical background, so that the final conclusions can be theorized according to different perspectives (George and Bennett, 2005). For them, typologizing encourages the development of theories by identifying the sub-categories of a broad phenomenon (ibid). On the other hand, the before- after approach to cross analysis offers a certain level of control over a study unit by dividing

it into two sub-units. In this context, the implementation of digital interventions in a conventional public space creates the condition for a before and after investigation (Khan & VanWynsberghe, 2008). A fundamental assumption on which the before-after approach is based on, is that only one variable is changing; In this case, the overall context and spatio-social conditions of public space remain the same with only change constituting the addition of the media installations for this particular period of time. Furthermore, to ensure that the major changing variable in the examined context was its digital enhancement, additional site visits were carried out not only before the application of the installations but also after their removal.

After the completion of the before-after analysis for each case study unit separately, the cumulative first findings were subsequently assessed again at the entire case level (MediaCity UK public realm), involving overall case pattern-matching and development of explanations. The latter allowed the researcher to identify “processes and outcomes that occur across many cases, to understand how they are qualified by local conditions, and thus develop more sophisticated descriptions and more powerful explanations” (Miles and Huberman, 1984: 172). The final result of this multi-stage cross analysis involved the overarching research driven theory of human experience in digitally enhanced public spaces.

5.3. Data Analysis

5.3.1 The Analytic Process

Data analysis in this study was carried out through three basic approaches; thematic analysis for the majority of the qualitative data (observations, interviews, Instagram data), spatial analysis (physical features of sites areas) and statistical analysis for the quantitative data (fig. 5.9). The data collection and analysis processes are designed according to the four basic units of analysis- a. public life and context, b. social activity and behaviour, c. individual perception and d. relationship with and contribution to placemaking process- applying Yin’s (1994) rational that multiple sources of data and analysis techniques enhance study’s validity. However, although the first stage of data analysis was conducted through three different approaches (spatial analysis, quantitative analysis, qualitative/thematic analysis) based on the nature of the data for the development of some initial themes and preliminary findings, the secondary analysis and overall data synthesis was conducted with the use of thematic analysis driven by grounded theory.

In this context, the analytic approach of this study aligns with that of grounded theory and, therefore, the principles of the analytic process have been formed accordingly through the development of a coding framework for the data analysis. Conducting data analysis applying a grounded theory approach uses ***codes*** to establish themes, categories or patterns within data. Coding is a process of searching and identifying common concepts and themes within various types of data (text, image, photograph) and finding links between them (Gibbs, 2007). Furthermore, as mentioned in Chapter 4, grounded theory is a method which involves the analysis of data through which methodical analysis can construct theory (Charmaz, 2014). The grounded theory processes and principles are illustrated below:

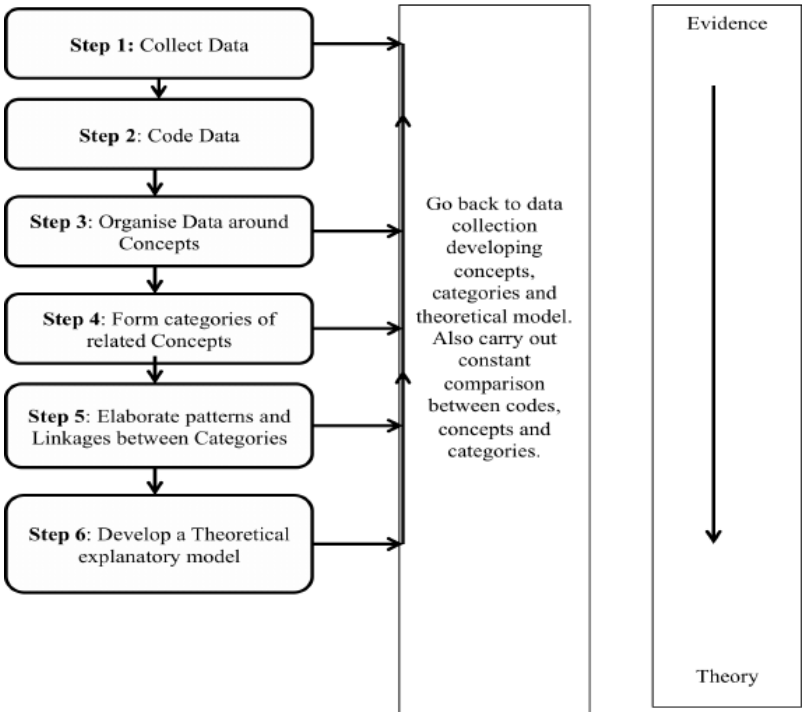


Fig. 5.8 Grounded theory processes and principles according to Glaser (1978). Image adapted from (Osborne O'Hagan and O'Connor, 2015)

The process includes the construction of analytic codes and categories within the data sets, applying iterative comparisons (Birks and Mills, 2011, Corbin and Strauss, 2015, Bryman, 2016) and memo writing to assess the links within the data. Employing early analysis of the data was crucial so that the data collection could be adapted to pursue initial concepts about the data (Charmaz, 2014).

a) Thematic analysis

According to Saldana (2009:3) *"A code in qualitative enquiry is most often a word or short phrase that symbolically assigns a summative, salient, essence capturing, and / or evocative attribute for a proportion of language-based or visual data"*. Thematic

analysis or thematic coding is a type of qualitative analysis which involves the documentation or identification passages of texts or parts of images that are related by a common theme or idea allowing their indexing into categories and, thus, establish a "framework of thematic ideas about it" (Gibbs 2007). Braun and Clarke (2006: 79) defined thematic analysis as:

> *'A method for identifying, analysing and reporting patterns (themes) within data. It minimally organises and describes your data set in (rich) detail. However, it also often goes further than this, and interprets various aspects of the research topic'.*

For Boyatzis (1998) thematic analysis acts as a communication tool for researchers who use different methods of inquiry. Furthermore, this type of data analysis is also considered as an effective way to summarize the main concepts of a large data set as it allows the researcher to form a comprehensive approach to dealing with data, enabling to structure a through final report (King, 2004).

The steps that were followed during the thematic data analysis in this study were based on the work of Braun and Clarke (2006) who suggested six fundamental stages*: a. Familiarization with the data* which included the several reads of the data before the identification of themes and codes, *b. Initial coding* which involved the identification and coding of repeated phrases in each reflection, *c. Meaningful theme generation* through the organization of codes. The outcome of the aforementioned stages was a number of categories and subcategories with a series of emergent themes. In addition, data saturation was reached as the fundamental theoretical features of the categories had become 'saturated' with data and, subsequently, these features uncovered patterns in the data (Charmaz, 2014*), d. Checking the validity of themes* through reviewing them, *e. Definition and specification of themes* according to emerging categories and trends and *g. final interpretation and report production*.

Generally, as noted above, the analysis was a continuous process, as emerging themes were reviewed and refined applying the constant comparative method (Birks and Mills, 2011), as well as conceptual mapping diagrams.

b) Spatial analysis

The spatial analysis particularly involved the assessment of data deriving from public space and public life surveys which are related to both physical and social dimensions of a space (Gehl Institute, 2017).

The analysis of physical characteristics of the case study area involved a contextual evaluation that looked at the current conditions of the site. Particularly, in that stage of the research some visual survey data as well as some fundamental spatial elements of the studied public spaces were analysed, planned and mapped. These data included spatio-physical features such as location, land use and building functions, dimensional considerations (boundaries, heights), natural physical features (topography, vegetation, water element) and building features (materials, colours, setbacks, etc.)

The social elements that were analysed and mapped involved mainly data regarding the stationary activity of users in public spaces, their circulation and popular flows within them as well as social activity and people interaction.

c) Quantitative analysis

Quantitative data in this research derived from the field observations (head count, number of human encounters, walking pace), Instagram data mining (number of posts at each space, number of likes, etc.) as well as from the psychophysiological experiment (survey/ self-reported responses which can be represented into quantitative forms and GSR metrics). Quantitative data involved all types of data that could be represented in the form of a number (Bergin, 2018). Their evaluation consisted of a statistical analysis which aimed to offer a greater level of accuracy and reliability in the results (Rubin and Abrams, 2015).

The software used for the data entry, analysis and representation was Microsoft Excel as it offers a great range of statistical analysis tools as well as other functions that can be utilized to run descriptive statistics. In addition, this software offers the typical spreadsheet functionality, which supports various analysis and data manipulation tasks, including graphical and presentation layouts generation. The steps followed for the statistical analysis of quantitative data through Excel was mainly the same for all different forms of the quantitative data of the study and it mainly included: a. the data gathering and collating, b. data processing where different formulas and built-in were used in order to assess data and draw results regarding the nature and concept of the data, and c. final presentation of the computed and organised data. (https://www.udemy.com/blog/data-analysis-and-interpretation/).

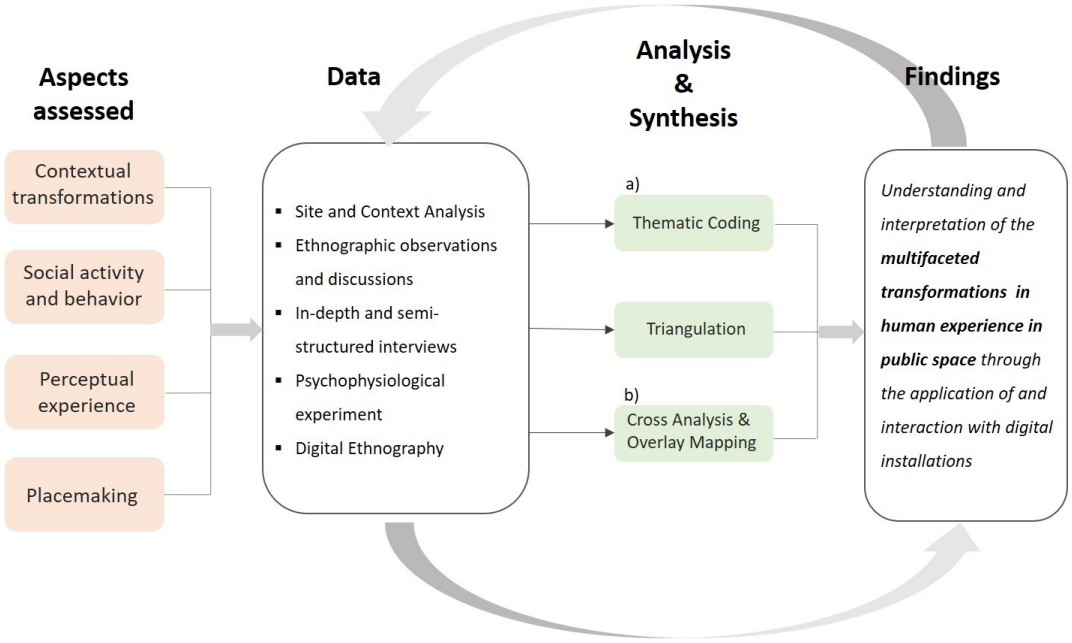


Fig 5.9 Research phases and methods adopted

5.3.2 Mapping and Data Visualization

"The visual brings fieldwork experience directly to the context of representation"

Pink, 2006, p.16

The above phrase of the anthropologist Sarah Pink highlights the importance of visual representations as a tool to communicate experiential data from fieldwork. Mapping is a valuable method of experiential research offering opportunity to the researcher to "(re)present place as lived and embodied" (Powell, 2010:1). Therefore, maps have been frequently employed as a method for the analysis and documentation of pshychogeographic and emotional (Nold, 2004) concepts of place, sensory data (Sennett, 1996; Howes, 2005; Daly et al., 2016)experiential landscapes (Thwaites and Simkins, 2007), social relations (Hillier, 2008) and cognitive and perceptual processes (Lynch, 1960)

Mapping as a multisensorial method

The feature of multi-sensoriality identified in mapping has also been recognised several times in scholarship. Pink (2006) notes that visual representations can also stimulate the senses of hearing, touching and other senses, while neurologist Cytowic (1989) has explored the phenomenon of *synaesthesia* in mapping sensory dimensions. Senses, cognition and action are associated embodied processes. **According to McDougall (1997: 287), the multisensory character of mapping**

can help researchers to address issues arising from the research of emotions, senses, body and identity by providing *a "language metaphorically and experientially close to them"*. Having the efficiency to render ambiguous and versatile forms of experience (Powell, 2010) mapping has been selected in this study as the main visual method of data representation (fig. 5.10-5.12).

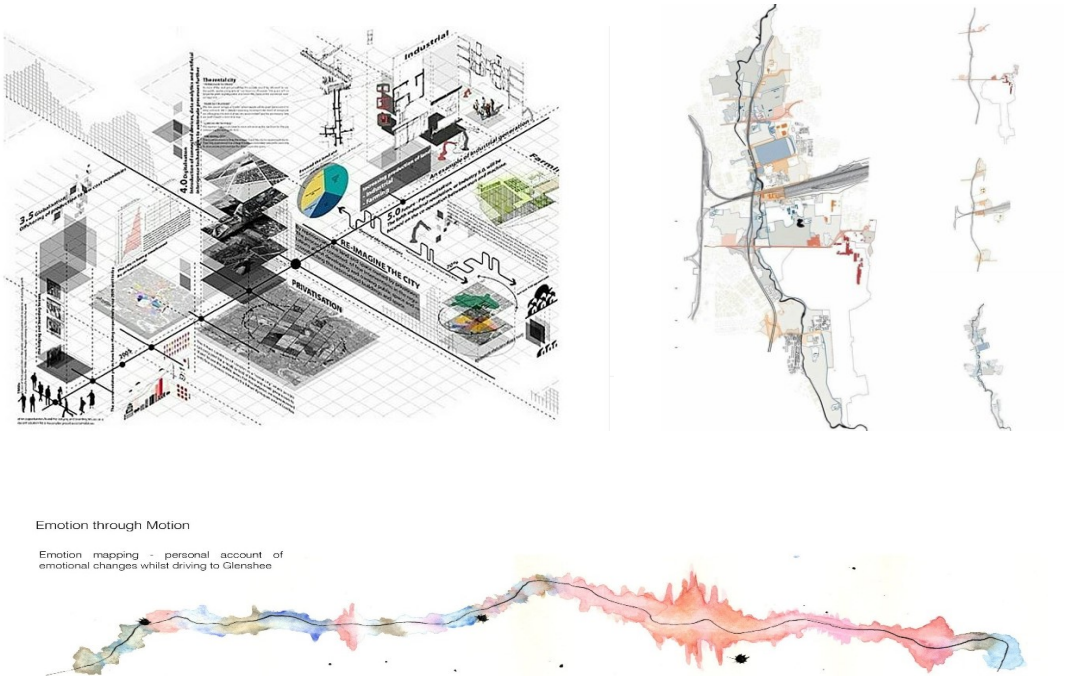


Fig. 5.10-5.12 Examples of experiential mapping (Act Of Mapping, available at /jolyday.com)

Mapping for Data Synthesis and Triangulation

Aldridge and Levine (2001), and Silverman (1999) highlight the significance of reliability of data collection through the strategy of *triangulation*. This can be done through the comparison and synthesis of the results deriving from various sources and methods.

According to Katsiaficas et al. (2011) mapping can establish a dialogue between parts of data and therefore transform or challenge the traditional research process. Futch and Fine (2014), having observed the pluralistic character of mapping, note its great value in mixed-method studies, standing alone by providing vital findings and not just complementing the other methods. They believe that mapping is capable of actively interrogating data at the stage of site analysis, while providing the researcher with exploratory ways of evaluating and representing human experience later. In that sense, place narratives are no longer limited to verbal descriptions and can be examined and re-synthesized visually and spatially. **Thus mapping is a powerful tool for data synthesis and triangulation for this study, acting as the**

main setting for the location and evaluation of knowledge deriving by the different research methods.

Particularly, triangulation can be conducted through the technique of *overlay mapping by overlaying various thematic experiential maps. Overlay mapping is a popular method for collecting and examining data in multiple layers (DiBiase, 1997).* By overlapping maps the researcher develops a composition comprising of the versatile outcomes of the study that allow to understand a phenomenon concentrated in an area holistically.

Case Study Selection	**Site**	MediaCity, UK (Salford Quays) public realm
	Digital Intervention Strategy	LightWaves 2018 digital art festival
	Units studied	a. Civic Plaza, b. Gardens, c. Waterfront promenade, d. Enclosed retail and leisure square
Data Collection	**Source of evidence**	Field observations, site and context analysis, in depth phenomenological interviews, semi-structured interviews, psychophysiological experiment and Instagram data and metadata
	Types of data	Qualitative and quantitative
	Aspects evaluated	Contextual transformations, social activity, interaction and behavior, individual perceptual experience and relationship of digital initiatives with the concept of placemaking
Data Analysis	**Thematic Analysis**	Qualitative data
	Spatial Analysis	Spatial data and plans
	Statistical Analysis	Quantitative data
Data Synthesis and Mapping	**Elements mapped**	Final data synthesis and comparison of various forms of digital experience in different types of public spaces through mapping

Table 5.10 Case study design

5.4 Ethical Considerations

Ethical considerations are significant in this study, as Sieber (1993:4) has advocated, they relate to “the application of a system of moral principles to prevent harming or wronging others, to promote the good, to be respectful, and to be fair”. The four main areas to consider regarding ethics in the field of social research, according to Diener and Crandall (1978), involve: participant’s harm, lack of consent, invasion of privacy and deception.

Therefore, prior to the conduction of data collection, ethical approval was requested and obtained from Research Ethics Committee of The University of Nottingham. To acquire this, a particular protocol was applied which provided thorough information on the structure of the study and its main objectives, detailed description of how the four aforementioned areas will be approached. Furthermore, all consent forms and data collection tools and procedures were submitted as part of the review process (see Appendix H).

The specific ethical features that the university protocol was focusing on and assessed, as also suggested by Bryman and Bell (2007), involved : 1. The study’s participants will not be subjected to any form of harm; 2. Researcher will respect participants’ dignity and prioritize it; 3. Full consent will be given before the conduction of the study; 4. Privacy of the participants’ will be assured, as well as 5. Sufficient level of confidentiality; 6. Anonymity of people will be guaranteed; 7. Proper communication and clarification of research aims and objectives to study’s participants should be pursued; 8. Declaration of any forms of funding will be assured; 9. Information about research results and expected period of publication

CHAPTER 6

Data Analysis In Case Study Units

This chapter aims to set the scene for the research context by conducting a holistic site analysis at the area without the presence of the media installations and subsequently presents the initial stages of data analysis at each case study unit separately during the presence of the digital interventions. Particularly, these initial findings will separately assess each of the case study areas and installations implemented in them, through four dimensions: a. Installation's design and main concept; b. Contextual implications of the intervention; c. Effects of the media installation on local social activity and human encounters; and d. Perceptual experience of the digitally augmented public urban environment. This part of the study analyzes and illustrates a high amount of qualitative and quantitative data deriving from almost all research methods applied in this research, essentially setting the basis for the detailed cross analysis and triangulation that follows in the next chapter that will assess the findings from a more holistic and comprehensive perspective.

6.1 Site Analysis (Public Realm as Canvas)

In this study it was crucial to appreciate and analyse the socio-spatial context and overall character of the site within which the digital interventions will sit. This contextual analysis involved the examination of the multi-faceted nature of city's built environment including the physical form such as the street patterns, urban plots and morphology as well as the aspects of human geography and local community dynamics. The overall approach to the data analysis aligns with the theoretical framework ad perceptions of place which suggest various layers of exploration and understanding- overall structure, flows, forms, functions, human interaction.

The site-analysis part of the study aims to set the foundations for the comparison that will be carried out in the following sections and investigates the dynamics of the four embedded public spaces as well as the overall performance of MediaCity UK and Salford Quays public realm (table 6.1). This analysis focuses on three main aspects of public space and public life; structure and functions, vitality and social life and perception. Particularly, it aimed to shed light on factors such as the local image of the place, the most crucial perceived problems and the behavioral characteristics both of the studied spaces but also of the overall public realm as a whole. To do that, spatial analysis, field observations and on-site discussions with local people took place.

This review of the existing situation allowed the identification of the most critical challenges as well as the strongest potential of the site and made it possible to critically examine the effect of the implementation of media interventions.

Site Analysis Field Trips	
Date	**1. 23/10/2018 (Tuesday)** **2. 30/11-02/12/2018 (Friday-Sunday)** 3. 11/03/ 2019 (Monday- Triangulation)
Weather	**1. Average temperature: 7° (real feel 5°), cloudy** **2. Average temperature: 6° (real feel 4), passing clouds** 3. Average temperature: 9° (real feel 6°), partially cloudy

Table 6.1 Field trips for site analysis

6.1.1 Plaza

The Plaza or MediaCity Piazza (or BBC Piazza) is the spatial focal point of MediaCity UK, as it s surrounded by some of the key buildings of the new development area such as the BBC Studios, the BBC Quay House and BBC Bridge House. Furthermore, it extends to the canal and it is also located in very close proximity the rest of the main facilities of the area as well as the central tram stop. It covers an area of approximately 4500 m^2 and it is directly accessible to Mediacity footpath which connects the area with Trafford. The character of the Plaza is commercial as it is solely surrounded by BBC functions and office spaces with no retail taking place on the groundfloor. This has as a result, the edges of the square to be animated to a certain extent but not particularly lively. Besides its commercial activity, the Plaza is a popular transition space as it connects BBC facilities with the tram station, the waterfront, a department of the University of Salford, Trafford area (to the South) and Weaste area (to the North) (fig.6.1).

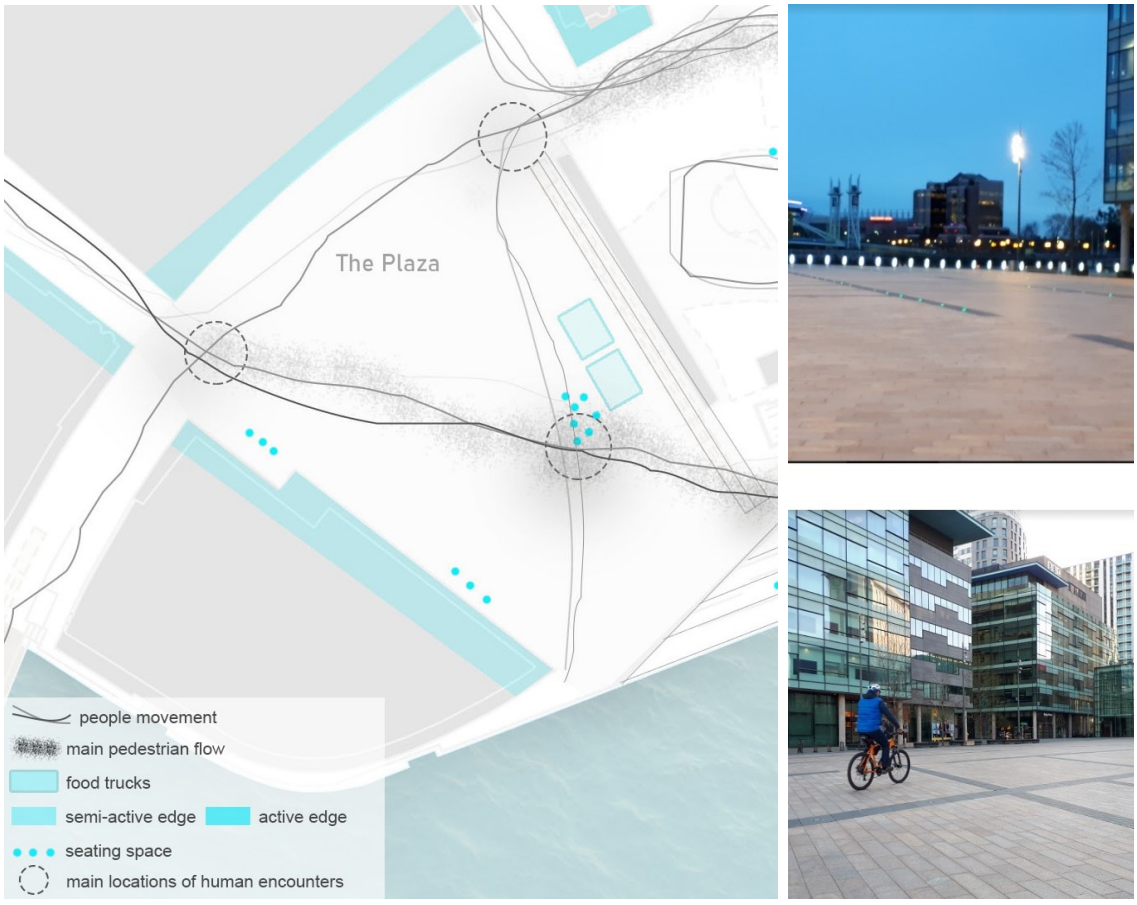
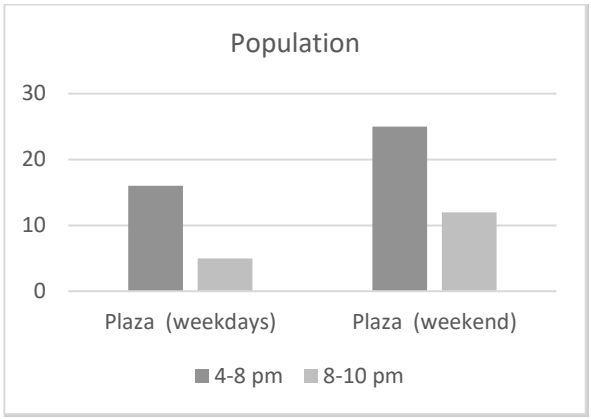


Fig.6.1 Site analysis of the Plaza without the presence of digital installations

During the site analysis the main factor that was assessed was that of *vitality* of the spaces and the main reason for that is that this concept integrates all the aspects of contextual analysis that were intended to be evaluated (urban flows, dynamics, form, function). Vitality refers to the degree a space's form support its functions and human requirements (Lynch, 1981) as well as the level of pedestrian flows, activity of street life and events taking place (Montgomery, 1998). Essentially it describes the degree to which a public space is successful both socially and perceptually.



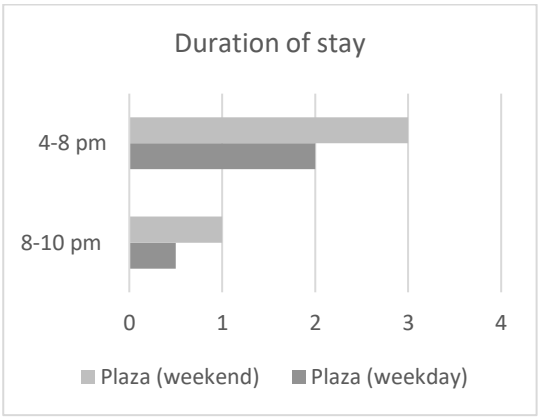


Fig.6.2 (left) Typical population of plaza in weekdays and weekends
Fig. 6.3 (right) Typical duration of stay at the plaza in weekdays and weekends

The main studies and surveys for the site analysis took place during the late afternoon and evening hours to allow the direct and equal comparison with the 'after' situation when the digital interventions were in place and working. The observations were held in hourly fifteen-minute intervals both on a weekday as well as on weekend. What was mainly observed is that this space, despite its great size, is generally poorly accommodated and it is mainly used as a walking path rather than an area for rest and repose. The average population on weekdays during the 15 minute intervals did not exceed 27 people, with 93% of them being just passers-by. For those who stayed, the duration of their visit was constituted a quick pause of 2-3 minutes. The vastness of the open area in combination with the minor animation of groundfloor edges and lack of opportunities for social activities has as a result the lack of social interaction and stimulation especially in weekdays (fig. 6.2, 6.3)

This is also confirmed by the walking patterns analysis which looked: a. at the type of movement and b. at the average pace of movement in order to reveal aspects of human perceptual experience in space. As noted in chapter 5.2.2, interactions with and perceptions of the surrounding environment highly affect the way we move throughout it.

The field observations revealed that 89% of people passing through the area adopted a purposive walking pattern, in a relative fast speed and with very low to none engagement with the environment (figure 6.5), while only 11% seemed to engagage with the setting. Moreover, through shadowing 25 people moving through the area and calculating each one's walking speed with the use of Microsoft Band 2, it was found that the average walking pace was 5.5 km/h. As mentioned in the previous chapter, the optimal walking speed in a stimulating urban environment ranges between 4.8-5 km/h(Gehl, 2010; Transport for London, 2010), although variations can be identified according to weather conditions, fitness level, demographics as well as suffiency of open space. Given that all walking studies of site analysis took place in the same weather conditions and involved variety of user demographics the main variable that affects the average walkng pace is considered to be the environmental stimulation and visual interest (fig. 6.4, 6.5). Therefore, the increased walking speed in Plaza indicated a rush which, according to Gehl (2013), implies a lack of environmental stimuli; in other words, a space poor in detail and with no presence of things in a very human scale and generally 'easy to comprehend' (Gehl, 2010: 43).

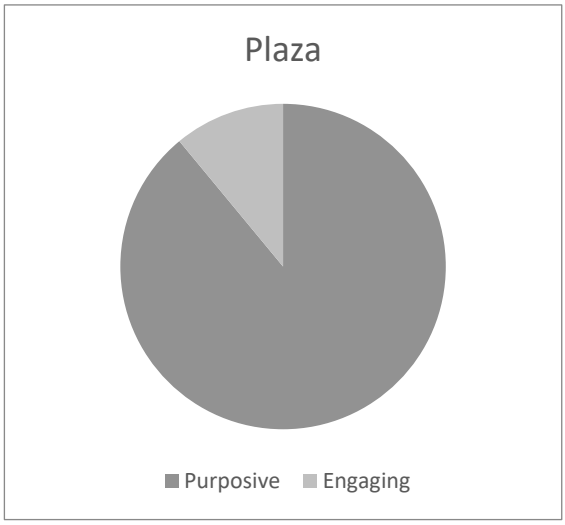


Fig.6.4 Typical amount of purposive and engaging walking at the Plaza

Fig.6.5 Example of purposive walking pattern at the Plaza. The person seems to have no engagement with the surrounding

6.1.2 Waterfront Promenade

The waterfront promenade can be considered as the most identical and psychologically restorative (Kaplan and Kaplan, 1989) public space of MediaCity's public realm due to the presence of the natural water element which constitutes the great asset of the area. This space, once been a ship canal dock edge, after the area's regeneration has been landscaped and a great part of it has been transformed into a long stepped terrace which reaches the water's edge. Its direct connection to the central tram stop makes the western of this promenade a common stopping point for users and frequently visited space (fig. 6.6).

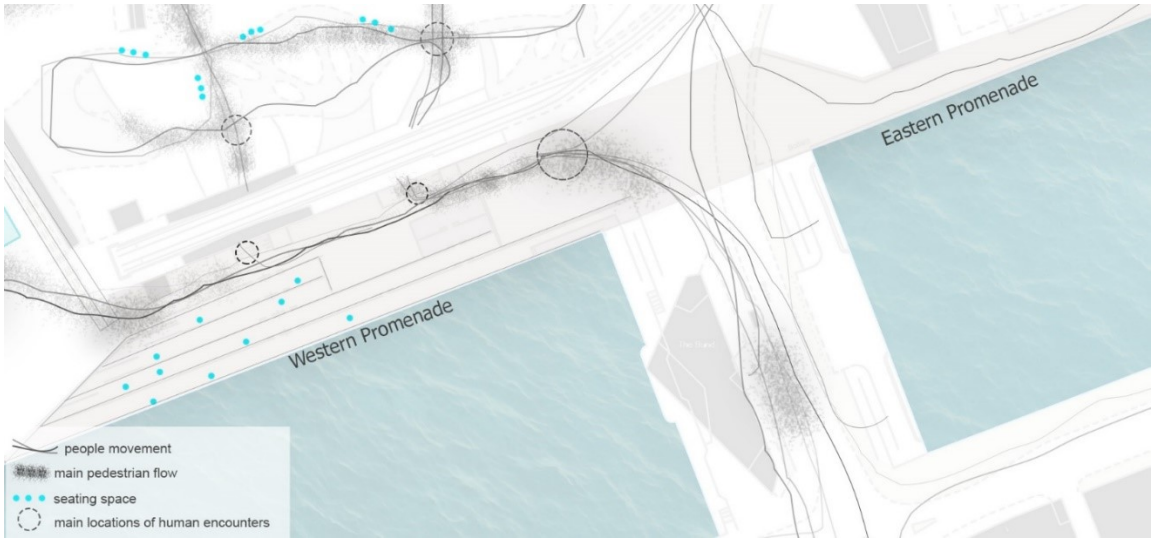


Fig.6.6 Site analysis of the Waterfront promenade without the presence of digital installations

However, despite its recreational character through the recently regenerated landscape and great vistas there are serious limitations on the vitality of this setting. For instance, although the stepped terrace offers a great availability of seating spaces the lack of further activities, uses and diversity of choices results in inactivity and monofunctionality (fig 6.7). Moreover, the inexistence of active building frontages (the western part of the promenade is 'defined'/ adjacent to open space, while the eastern part is defined through residential blocks) results in lack of further visual engagement and stimulation and therefore limited experiential importance (Bobic 2004; Thwaites, Simkins, and Mathers 2013; Heffernan et al., 2014).

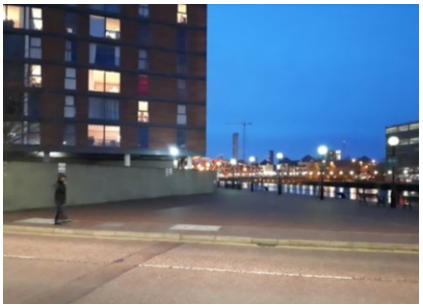
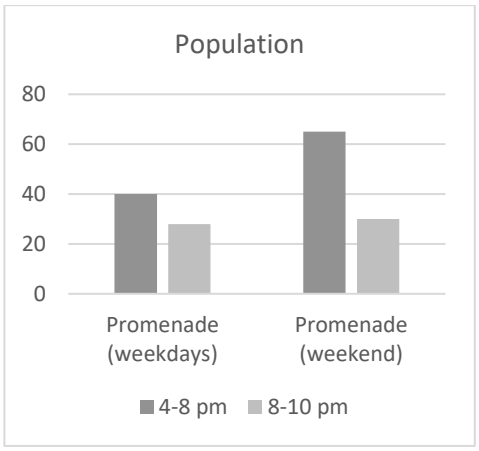



Fig.6.7 (left) Waterfront promenade - stepped terrace
Fig.6.8 (right) Waterfront promenade- eastern part

Promenade's connection to the tram station as well as the residential parts of the area makes it a highly used walking path for workers of the area and give a feeling of working and relatively active atmosphere in the mornings and evenings between 5 and 6 pm (fig. 6.9, 6.10, 6.12). The area is also used for cycling and jogging in the evening hours, however the overall population and duration of visitor's population in the area is still quite low, especially in the eastern part of it (fig. 6.8).



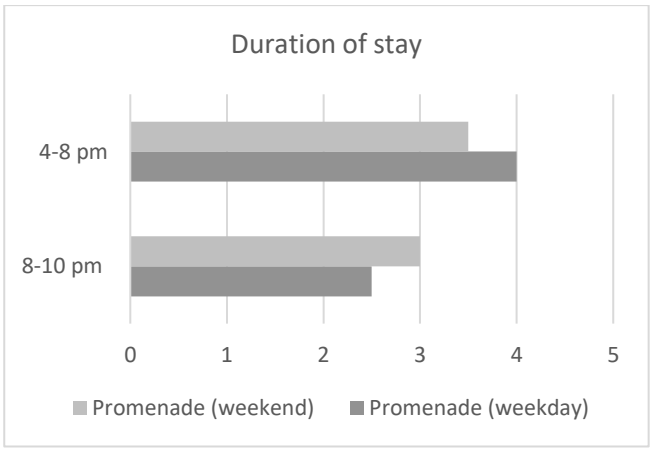


Fig. 6.9 (left) Typical population of waterfront promenade in weekdays and weekends
Fig. 6.10 (right) Typical duration of stay at the waterfront promenade in weekdays and weekends

In terms of the perceptual response through walking pattern study, the majority of the people again did not indicate awareness or particular interest for the surrounding context, however they showed more engagement comparing to the Plaza. Specifically, the average walking pace here drops to 5.3 km/h, while the amount of engaging walking motif reaches 32% (fig. 6.11).

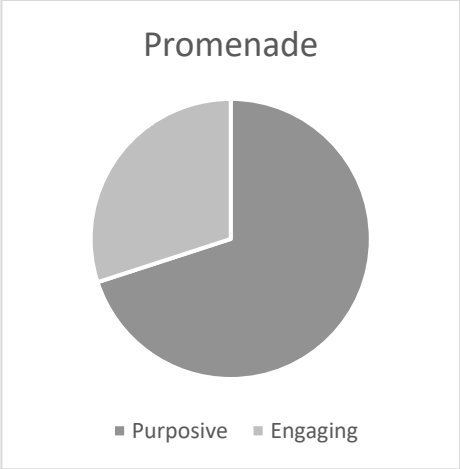


Fig.6.11 (left) Typical amount of purposive and engaging walking at the waterfront promenade
Fig. 6.12 (right) Active node of the promenade around the tram stop

6.1.3 Enclosed Square

The Enclosed Square, or Lowry Square, is a retail plaza located in the south part of Salford Quays public realm. Surrounded by the large structures of the Lowry theatre and the shopping mall and through its reasonable size (covering area of approx. 3500 m^2), this public space is characterized by a sufficient level of enclosure. Furthermore, being directly connected with two footbridges (one leading to central MediaCity UK and the other leading to Trafford area) this public space can be also considered as quite accessible. Furthermore, consisting of multiple functions such as shops, bars, restaurants, cinemas and various shows, this public space shows the highest level of visitation of the area.

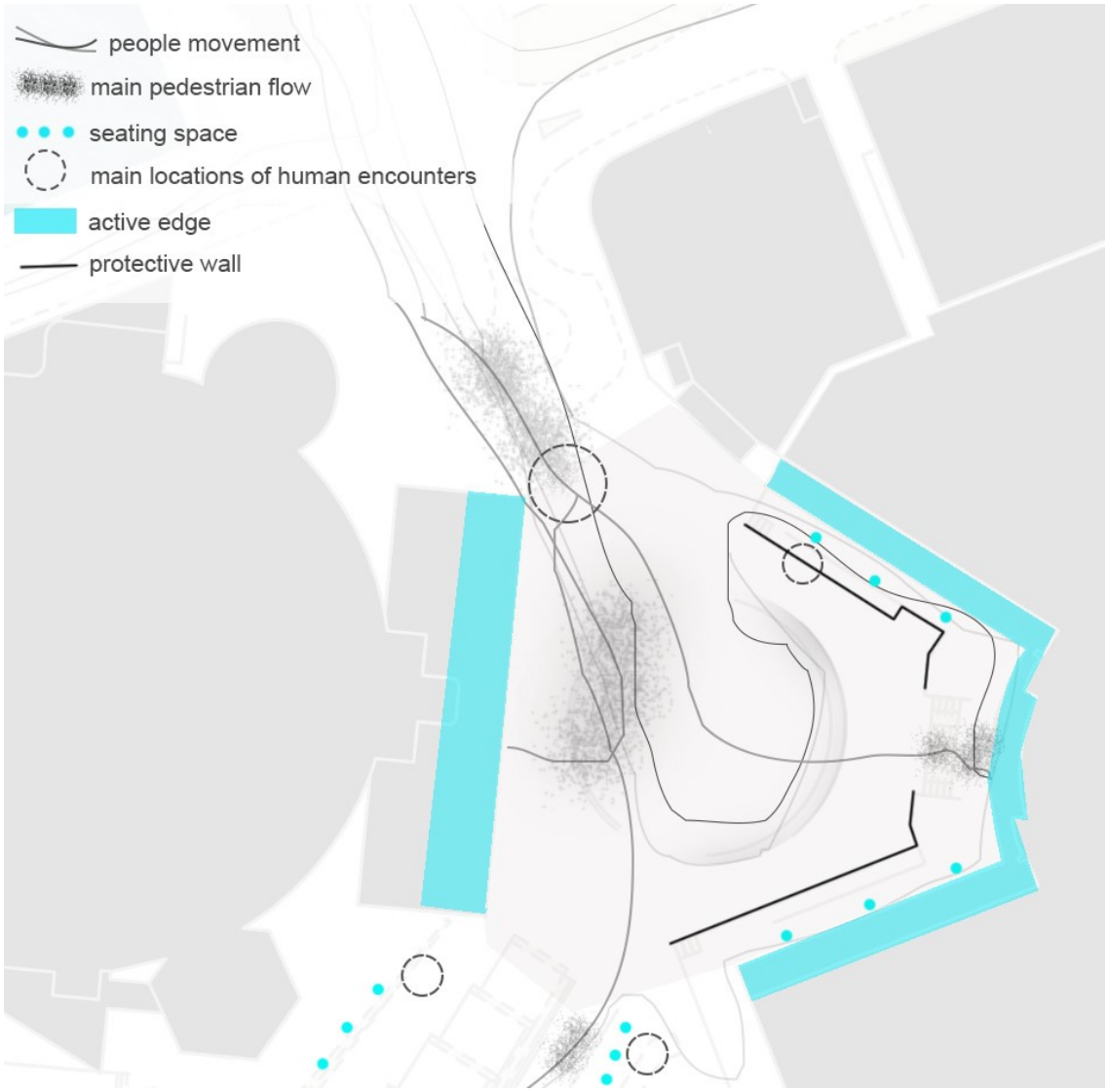
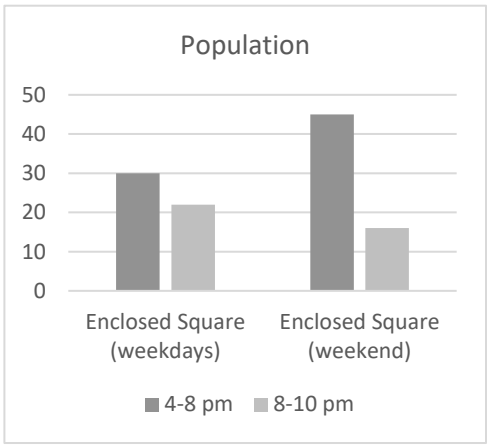


Fig 6.13 Site analysis of the Enclosed Square without the presence of digital installations

The area's population is quite high on weekends, especially from 10am-8 pm and that can be explained trhough the variety of activities accommodated (fig. 6.14). However on weekdays and particularly in late evenings this space is also quite in active with most people using it as a transitional area, either on their way home or for the visit of Lowry theater. Work and retail places such as shops and restaurants still perform their activities however there are no social interactions observable in public space. Ultimately, the two primary locations of human interaction is at the northern and southern part of the square in close proximity to the bridges (fig.6.13), potentially due to the existence of sense of human scale through some seating areas and canopy.



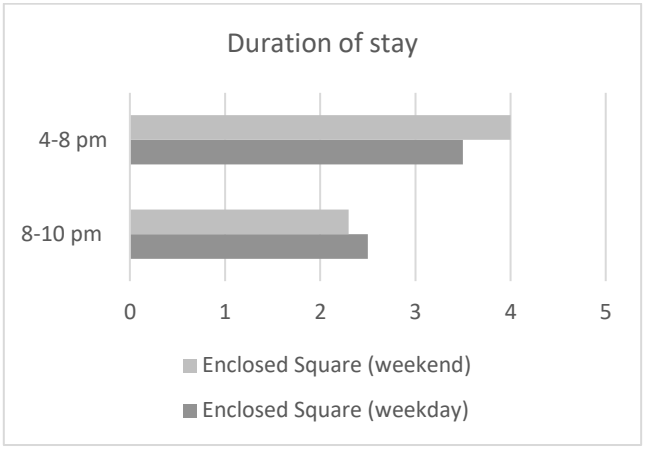


Fig. 6.14 (left) Typical population of the Enclosed Square in weekdays and weekends
Fig. 6.15 (right) Typical duration of stay at the Enclosed Square in weekdays and weekends

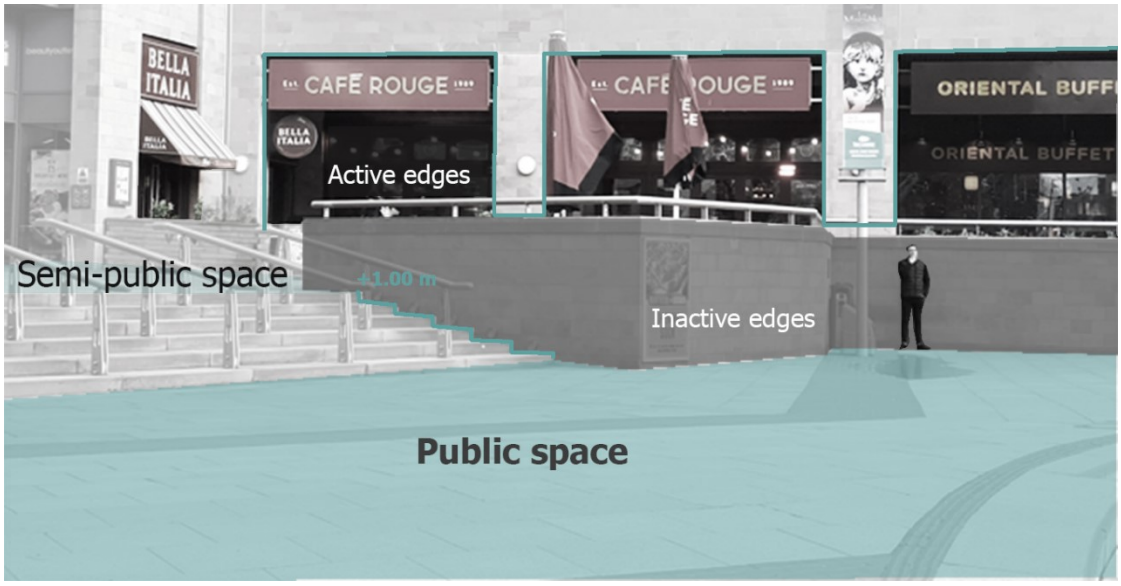
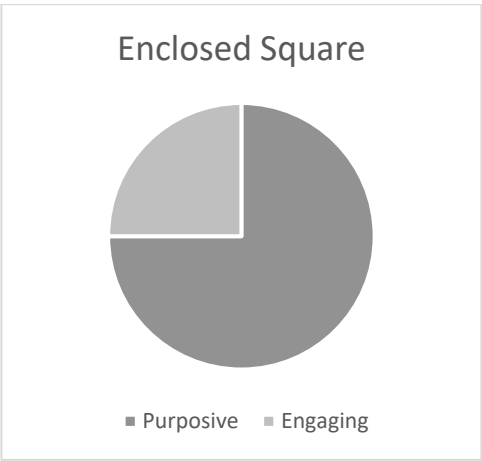


Fig. 6.16 Edges and human activity at the square

In respect to perceptual response, the experiential quality of the central part of the square seems quite low. The majority of users (75%) perform purposive walking (fig.6.17, 6.18) in an average pace of 5.2 km/h and the lack of seating spaces has as a result a constant state of movement across the area. However the situation is different on the upper zone of open space in front of the bars and restaurants, where however there is no space for free seating. The result is that there is a quite vast open space without serious activity of edges, seating areas and therefore social interaction at the main part of the square, with a quite vivid separated upper zone of privately owned open space (fig.6.16).



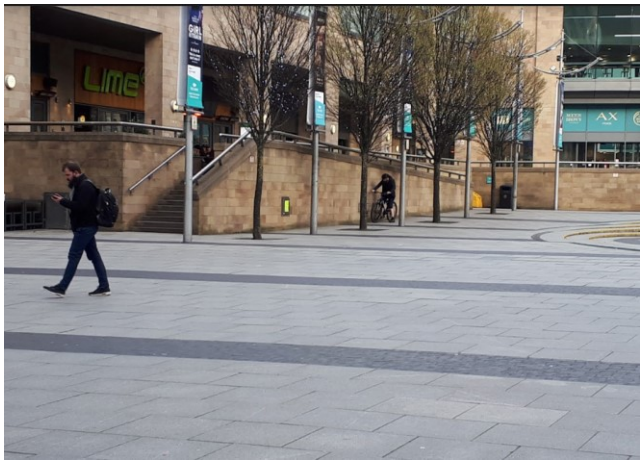


Fig.6.17 (left) Typical amount of purposive and engaging walking at the Enclosed Square
Fig. 6.18 (right) Example of person performing purposive walking; The man is focused on the mobile phone without paying attention to the physical environment while moving across the area

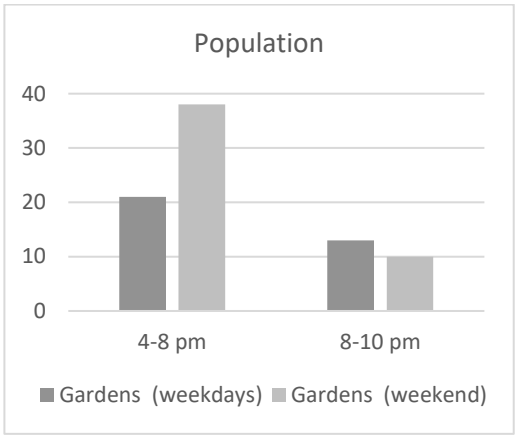
6.1.4 Gardens

The Gardens or Blue Peter Garden comprises the green and soft-landscape part of MediaCity's public realm being adjacent to the Plaza. Its north edge faces Green street which is the main retail strip of the area accommodating a number of active ground floor uses such as bars, cafes and restaurants. The long continuous frontages along with the considerable building heights (20-52m) enhance space's definition and sense of enclosure. The western part of this public space faces the facilities of University of Salford making it also a frequently visited area by the students of the department. Furthermore, this part of public realm constitutes the ending point of the three main streets of MediaCity- White street, Pink street and Orange street, giving a sense of centrality as well as spatial and conceptual prominence (fig. 6.19).

Fig.6.19 Site analysis of the Gardens without the presence of digital installations

In terms of area's vitality, although the overall population in weekdays is analogous to the rest of public spaces studied, the duration of stay is considerably higher. That shows that people of the area choose this space to rest, spend time or just wander, and perform social activities. Therefore, human interaction is higher and social encounters more frequent in this part of the site. This is also reflected on people's perceptual response through their movement which is engaging in a much higher extent (44%) comparing to other public space according to the walking patterns study (fig. 6.22). Moreover, the average walking speed here drops to 4.5 km/h implying a greater level of visual interest and interaction with the setting and/or its people. The engagement with the spatial setting is also encouraged by the presence of diverse urban equipment which not only includes

benches for seating purposes but also some metal installations for play, workout or just bodily exploration (fig. 6.23)



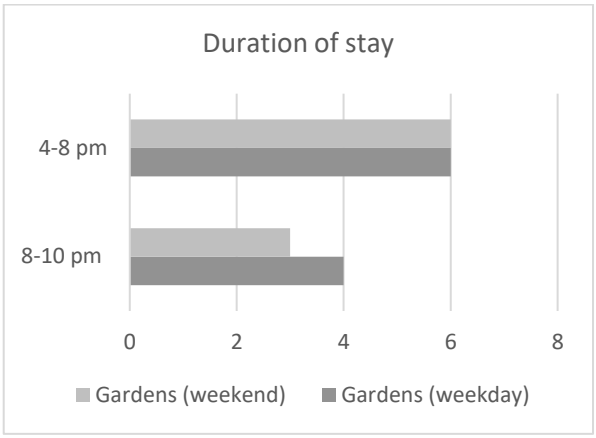


Fig. 6.20 (left) Typical population of the Gardens in weekdays and weekends
Fig. 6.21 (right) Typical duration of stay at the Gardens in weekdays and weekends

Another critical characteristic of this public space is its adjacency with the Mediacity tram stop, which makes it a popular transition area for people who wish to take tram. This has as a result the Gardens to have an ambiguous character of both as area for repose and recreation but also as transitional space, without however being incoherent or illegible. This is also encouraged by the circulation system which includes a set of direct, straight and wide routes leading directly to the tram stop but also a set of more narrow and organic paths which promote wandering and exploration. Finally the location and longitudinal spatial arrangement of the Gardens, is also one of its important assets as through its parallel organization to the waterfront promenade, it offers multiple views to the canal.

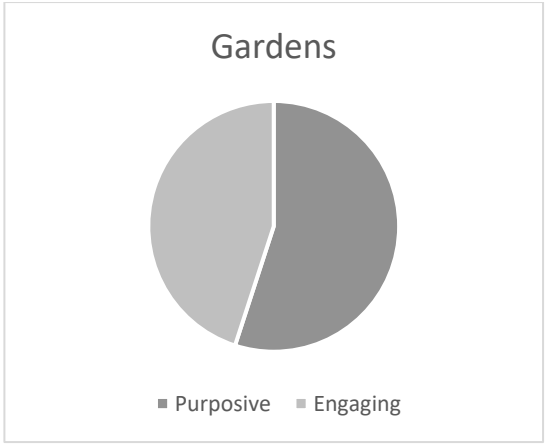


Fig.6.22 (left) Typical amount of purposive and engaging walking at the Gardens
Fig. 6.23 (right) Example of person performing engaging and explorative patterns of move across the area; the urban equipment triggers supports these forms of behaviour

Ultimately, the Gardens can be considered as the most successful and vital part of MediaCity's public realm through its form, scale, organization and connectivity but also through its social and perceptual performance encouraged by active uses and edges, human activity and social interaction.

6.1.5 Overall

The overall site analysis of MediaCity UK public realm showed that the majority of the public use of the area involves, especially in weekdays, transportation rather than seating, relaxation and social interaction. Furthermore, user profile was not rather diverse as it mainly included workers and students of the area the age of which ranged primarily between 20-50 navigating the area alone or in small groups. However, profound changes both in population as well as in duration of stay are observed in weekends. Users were more varied including also families and elderly people who also appeared in bigger groups. Nevertheless, young people were noticeably less than in weekdays as young population is essentially related to university functions. In terms of activities, the diversity of choices provided by all of the studied public spaces did not seem enough to offer people a form of experience that would be able to keep them outdoors for the same amount of time as they would spend in any indoor activity.

To understand more precisely people's perceptions and impressions of the site itself, on-site discussions took place with 41 people from various demographic groups (see Appendix C). The discussions involved pre-determined as well as probing questions which mainly focused on users' purpose of visit, impressions of the site as well as perceived major advantages and disadvantages. In order to eliminate discussions regarding necessary activities and purpose of visit such as going to work and to primarily examine the level of space's perception as a public space for social activity, the study took place in weekend (1/12 and 2/12/2018).

Fig. 6.24 People's impressions of the site area

Sample	
User	**Comment**
U1, 36, Female	…the space tends to be very quiet and boring in the evenings, even in weekends
U7, 58, Female	…the buildings are nice and stylish but a bit cold. You don't really feel comfortable around them for some reason
U12, 65, Male	…walking in the gardens or by the canal is very relaxing
U23, 20, Female	…the view from the steps is pretty cool but I can't see the point of staying long
U48, 44, Male	…after office hours the space gets really quiet and especially the Plaza seems almost always pretty gloomy

Table 6.2 Sample of user's comments during on-site discussions

In terms of positive feelings and impressions, people pointed out the presence of the water element at the canal and green element of the Gardens, the newness and cleanliness of space, the diversity of activities offered in the Lowry Theatre and its accessibility. On the other hand, in terms of their negative perceptions, most of them emphasized on the lack of vibrancy particularly on weekdays afternoons, the lack of character and ambiguous identity and lack of human scale and visual interest (often

referred to as ‘cold’, ‘unwelcoming’, ‘monotonous’, ‘not engaging’) (table 6.2 6.3; fig. 6.24).

Positive impressions	Level of positive impression	Percentage of people mentioning it
Natural element of canal and green space	High	77%
Newness and cleanliness of space	Medium	43%
Lowry theater activities	Medium-High	27%
Accessibility/ connections to the city centre	Medium	13%
The problems	**Level of the problem**	**Percentage of people mentioning it**
Lack of vibrancy and human activity	High	88%
Characterless and with vague identity	Medium-High	35%
Lack of human scale	High	56%

Table 6.3 Main positive and negative impressions of the site according to the users

The data from on-site discussions with users also indicated four main reasons of visiting the area: a. to have a walk (or dog-walk) by the water or at the Gardens (39%); b. to visit the shopping mall(27%); c. to go to the Lowry Theater (15%) and d. to visit Alchemist bar (12%) or visit the rest of restaurants/ cafes of the area (7%). These figures do not suggest a high level of appreciation and enjoyment of area’s public realm by the majority of people. Furthermore, most of shopkeepers, as part of interviewees that act as constant observers and users of the area, agreed that the majority of street life depends actively on the presence of the workers and students. Therefore, as also found through field observations the main flows of human movement are concentrated:

1. Towards the tram stop (mainly starting from street junctions) (necessary activity)

2. Along the retail strip of Green street (active edges, human scale, visual engagement)

3. Towards the Lowry theatre and shopping mall (optional activity)

Consequently, human interaction is also concentrated in areas onto or adjacent to these flows, through social encounters that mainly do not exceed four people. Furthermore,

these encounters were distributed on-site at great distance from each other (more than 7m) allowing no further interaction between them and meeting with strangers. As a result, any type of interaction with strangers or spontaneous encounters that are also indicators of positive public space experience (Mehta, 2014) were not observed at all.

In conclusion, the findings of the site analysis suggest that the overall appreciation of MediaCity's public spaces in terms of their experiential qualities and richness can be related to what has been noted in section 2.2 as *placeless* or a *neutral public space.*

6.2 'Youth Culture' at The Plaza

6.2.1 Installation Design and Concept

The installation implemented at the Plaza, during the case study event LightWaves 2018, is the digital sculpture Youth Culture designed by the British artist Stanza. The artwork consists of a 3-meter tall, hooded sculpture placed on a 0.6 m plinth and it mainly comprises data visualization and information flows. Particularly, the installation visualizes various data being received on mini screens as well as light illumination embedded in its structure. The concept of several cameras' and screens' incorporation into the artwork has deeper associations with 'paranoia of the data and surveillance landscape of which we are all now observed'. The final result is an installation which embeds LED lighting controlled by city data and also a secondary system of micro-cameras and CCTV screens stimulated by the users around it. Regarding the city data, they include data from Manchester city bus stops, river flows, pollution levels which trigger LED lighting onto the sculpture and affect lighting behaviour (colour and intensity) through their flows, *as a generative system created by the city* (https://stanza.co.uk/youth_culture/index.html). Specifically, following the data 'reading' and processing, it is illustrated into illuminated streams running through sculpture wires (fig. 6.25).

Fig.6.25 Youth Culture by Stanza at the Plaza (https://stanza.co.uk/youth_culture/index.html)

During an interview conducted on 20 February 2019, the designer noted that the idea of the relationship between this digital intervention and the city and its citizens is twofold; a. the urban data is reflected onto a human figure where the hoody symbolizes the young generation (which will highly use technologies such as sensors, city quantitative data and CCTV in the future) and b. the audience is embedded into the artwork both at a personal as well as a group level (through the cameras and screens), making it part of a 'bigger participatory spectacle' wishing to respond to wider concerns on the concepts of collective space.

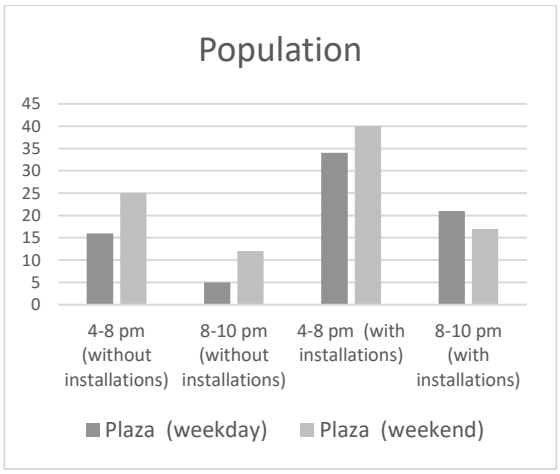
6.2.2 Contextual Implications

The media installation was located towards the middle of the southern edge of the Plaza which, although affords attractive views to the canal, it is generally the less visited part of it (fig.6.1). The interactive project, according to its designer, wishes to challenge phenomena of social isolation and promote people's collective ability to create safe places (Stanza, personal Interview, 20/02/2019, Int.D1).

Field observations including population studies were held throughout all the period of installations' implementation and showed a sharp increase both in terms of area's visitation but also in duration of stay. Below there are two charts illustrating the Plaza's population and duration of visit both on a weekday as well as weekend. The data shows that although the weather conditions were worse both of those days comparing to the population samples taken during the site analysis, the total population of the area showed a rise of 113% in weekdays during the timeframe of 4-8pm, with a noticeable shift in user profile, and 60% in weekends during the same timeframe (fig. 6.26).

Date	(Average) Weather Conditions	Time Period of Analysis
Weekdays (10,11,12,13,14/12/2018)	5° (real feel 0°), Humid weather	4pm-10pm
Weekend (Saturday 8,9/12/2018)	4° (real feel -1°), Humid weather and periodic rain	

Table 6.4 Field observation data collection



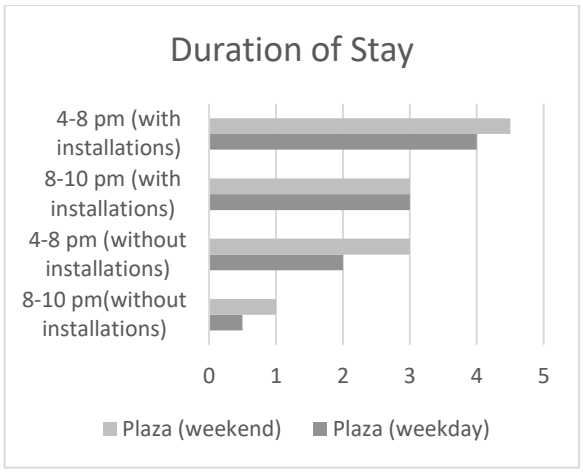


Fig. 6.26 (left) Comparing Plaza's average population in weekdays and weekends with and without the presence of the digital installations

Fig. 6.27 (right) Comparing average duration of stay at the Plaza with and without the installations

Furthermore, the average duration of stay in the area in weekdays between 4-8 pm increased by 100%, reaching 4 minutes, while in weekends the average stay at the area was extended to 4.5 minutes. The field observations showed that this overall stay consisted of 1-2 minutes observation of the installation and its surrounding space and visual interaction with it and the people using it (spectator mode in observation and social space) and 2-3 minutes actual engagement with the installation (player mode in interaction space) (fig. 6.27).

In that context, installation's designer states that through embedding cameras and micro-screens showing users faces within the sculpture his goal was to create a playful character and utilize the audience as part of a bigger spectacle in public space (Int. D1) (fig. 6.28). This new 'spectacle' that led to contextual transformations of site's population, also affected the pedestrian flows throughout the square which now seem to be considerably denser towards the south-west part of this public space, leading mainly to the digital intervention rather than pointing the tram stop (fig.6.29). Furthermore, through the slight reorganization of the food-trucks which now create a more intimate corner, it seems that almost half of the total square area which was previously inactive has now gained some new active edges and uses resulting in a more vibrant character, at the south part. However, the north part of the square is out of the influence zone of the digital intervention and looking at the backs (inactive edge) of food trucks shows limited contextual transformations in terms of area's vitality (fig. 6.29).

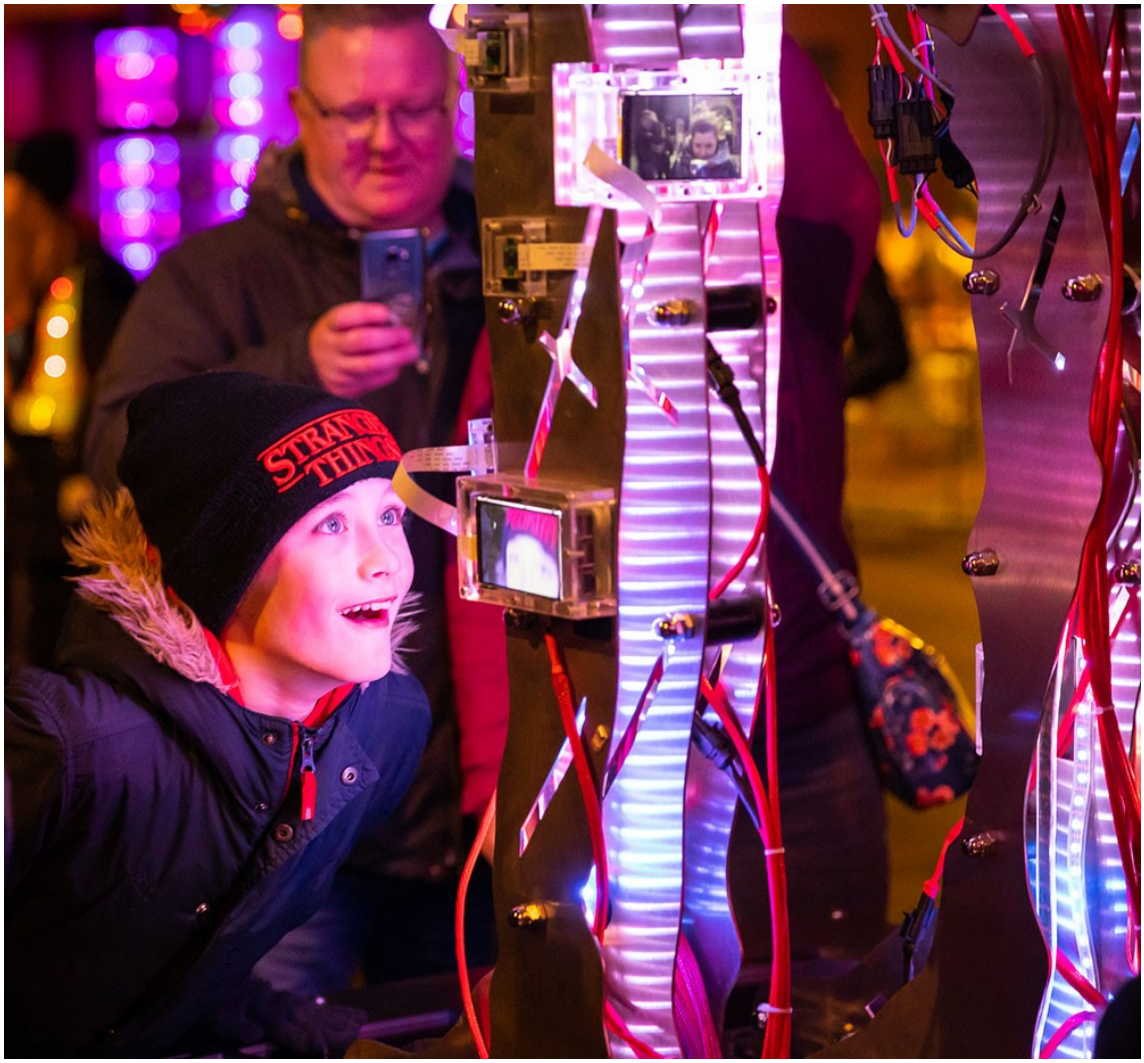


Fig. 6.28 Expressions of excitement during the exploration of the artwork (https://stanza.co.uk/youth_culture/index.html)

6.2.3 Social Encounters and Activity

Fig. 6.29 Site analysis of the Plaza during the presence of the installations

In terms of the transformations on the social activity of the area during the implementation of Youth Culture, the digital artist states that he wanted this installation to be able to bring together various users from different ages and backgrounds. Consequently, that was the very reason he based his design on a multifold concept open to several interpretations and types of engagement so to initiate also different forms of interaction between people. Provision for a particular target audience was out of the scope of this media intervention (Int.D1).

As shown in the figure 6.29 activities and interaction taking place within the Plaza are mainly concentrated towards the interactive installation. The increase in total population led also to a sharp increase in the number of human encounters which are now ranging between six and seven. However, the most critical transformation refers to the quality and distribution of the encounters which in this case are denser and consist of more people allowing easier socialization and closer vicinity with strangers. It is worth mentioning that the average distance between people within the interaction zone (strangers and non-strangers) was generally between 0.4-1 meter (fig. 6.29) which,

according to Hall (1966) characterizes intimate and personal spaces as these distances involve usually physical interactions and personal conversations. Moreover, the average distance of strangers (either as individuals or as groups) within the socialization zone was around 3 meters which is also a characteristic of social space (ibid).

In concurrent with the observations on the socio-bahavioral use of space, transcripts from interviews with people working at the area offer further insights into the people's motivation for interaction. In the case of Youth Culture, a food truck owner located in the Plaza mentioned that people were mainly initiating conversations in order to figure out the function of the digital sculpture which seemed to be complicated to them.

> *"I've noticed that People interact in order to figure out how the artwork works. They discuss its idea and potential "explanations", especially the adults and those who're kind of techno geeks!"*

Eve, 35, food-truck owner, personal interview, 12/2018 (Int.S1)

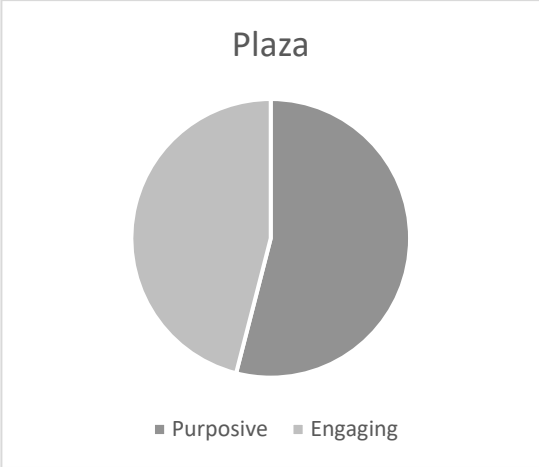
6.2.4 Perceptual Experience

During the personal interview the designer stated that one of his main goals through this installation was to raise playfulness in public space and also invoke feelings of surprise and curiosity when people come across the sculpture while walking and they gradually get to understand its function and 'discover' themselves into it. He pointed out that he aimed to grab people's attention from a certain distance through the perpetually changing lighting colours triggered by the data streams. Furthermore, he emphasized that he also sought to promote physical bodily engagement with the sculpture expecting people to explore it through their bodies, climb on it or mimic it (Int.D1).

However, besides playful behavior and feelings of contentment the designer noted that he wished to indirectly convey some strong social messages involving the empowerment of female Youth Culture through a sculpture that shows a woman "standing up strong". In this context, "The artwork can be approached through different lenses and explored in different levels. The vision and interpretation become subjective based on your knowledge of the world" (Int.D1).

In terms of people indirect perceptual response, the walking patterns studies showed a significant drop (from 5.5 to 4.2 km/h) in people's walking pace as well as a profound increase in the amount of people who performed engaging walking (fig. 6.30). These

transformations imply that people enjoy more their visit to the Plaza while it accommodates the installation and have more things and people to engage with in their surrounding environment.



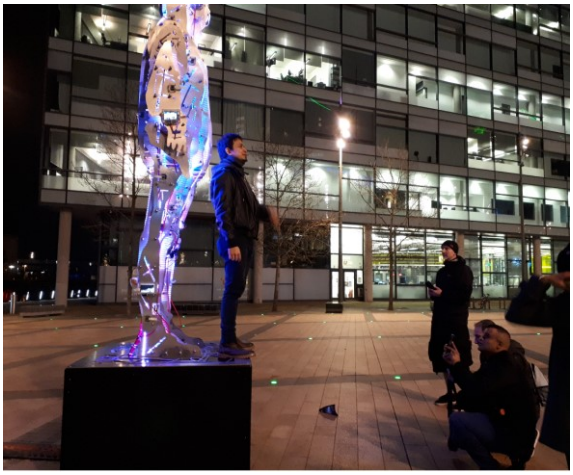


Fig.6.30 (left) Amount of purposive and engaging walking at the Plaza during the presence of Youth Culture
Fig. 6.31 (right) People engaging with the artwork

Food truck owner located at the Plaza highlighted interestingly the way people decide to approach and engage with the installation while walking through the area:

> *"I noticed a lot of people starring from a distance and then coming closer. I think they initially observe others in order to get an idea of how it works and then they gradually approach. It's like trying to reflect on it in two perspectives"*

Eve, food truck owner (Int.S1)

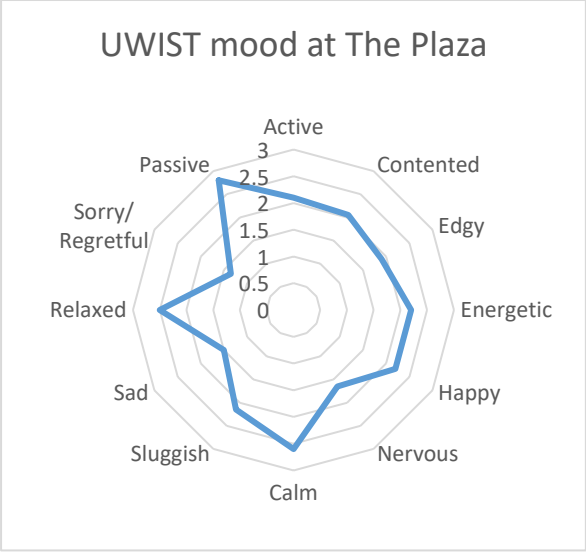
She also noted that she very often noticed people physically engaging and playing with the artwork by jumping and climbing on it, a behaviour that most of the times triggered more people to follow and mimic them, resulting in all the people that surrounded the installation to laugh together and take pictures from each other although they did not know them (Int.S1). This type of reaction was also observed frequently during the field observations (fig. 6.31)

However, in terms of people's emotional experience, the data collected from the self-reported mood checklist during the conduction of the psychophysiological experiment show generally medium levels of hedonic tone (happiness) as well as low levels of stress (tense arousal). Particularly, the mean value of the responses of all twenty participants seems to be higher when related to feelings of passivity, sluggishness and relaxation,

while being considerably lower regarding feelings of energization and nervousness (figure 6.32). These results are also partly in line with food truck owner's observations who noted that although people were initially impressed and playful with artwork's physicality, they subsequently *seemed "puzzled and curious about how this system works."* (Int.S1).

However, in terms of their perceptions regarding their overall space and installation experience people reported negative values related to feelings of welcomeness and attractiveness of the area as well as in regard to opportunities for discovery and exploration (table 6.5).

Restorativeness, sociability and usability	Mean Value
I feel **welcomed** in this place	**-0.45**
I feel **safe** in this place	0.25
I find this place **attractive and pleasant**	**-0.85**
I find this place **easy to socialize** and meet people	0.15
There is **much to explore and discover** in this place	**-0.45**
I found the installations **easy to play with**	0.55



Energetic arousal: active, energetic, sluggish, passive
Tense arousal (i.e stress): edgy, nervous, calm, relaxed
Hedonic tone (i.e. happiness): contented, happy, sad, sorry

Table 6.5 (left) Perceived level of restorative qualities of digitally augmented Plaza
Fig. 6.32 (right) Self-reported UWIST MOOD after the engagement with digital artwork at the Plaza

6.3 'Relax & Release' and 'The Heartbeat' at The Waterfront Promenade

6.3.1 Installation Design and Concept

During the digital event the waterfront promenade was mainly activated through the implementation of two media installations deployed in relatively close proximity to each other; Relax & Release by Kimatica Studio and the Heartbeat by GNI Project.

Relax and Release is an interactive installation which mainly comprises the release of motion-triggered colourful visual effects on vertical surfaces such as walls or canvases and was applied on a blank inactive fence-wall located adjacent to the key car road of the area(fig. 6.33). This digital artwork promotes movement and play while "inviting users to take a journey through the states of relaxation and release, immersed on colourful visuals, facilitating exploration of the body's movement without constraints or directions" (Kimatica Studio, 2016, https://www.artinfluxlondon.com/kimatica-studio.html). During a personal interview conducted in light of this study, Maria Almena from Kimatica Studio stated that through their piece they aimed to create an interactive experience which is revealed (at least) in three different layers -movement, relax and release (fig. 6.33)- in order for it to be variously engaging and able to attract diverse user groups (different ages, different levels of familiarity with art, different abilities of movement, etc.) (M. Almena, personal interview, 21.03.2019, Int.D2).

Fig. 6.33 Relax n' Release Installation by Kimatica Studio at the Waterfront Promenade

The Heartbeat is an interactive light artwork which consists of suspended aluminum bars which, when views from certain perspectives, forms the shape of a heart. The bars are lit by LED strips and spotlights, but for the heart shape to illuminate the users need to

join their hands in order to complete the electric circuit and trigger the lighting system (fig. 6.34). This installation was placed opposite to Relax and Release, at a key location of the waterfront promenade, “encouraging visitors to make a connection of love or friendship with this large-scale work, by joining hands in front of the sculpture” (Ingo Kalecinski from GNI Project, 2019, personal interview, 5 April, Int.D3). During the interview Ingo from GNI Project, also, pointed out that their main idea was *to “visualize every individual emotional journey viewers may have had and create that moment of reminiscence.” (Int. D3)*

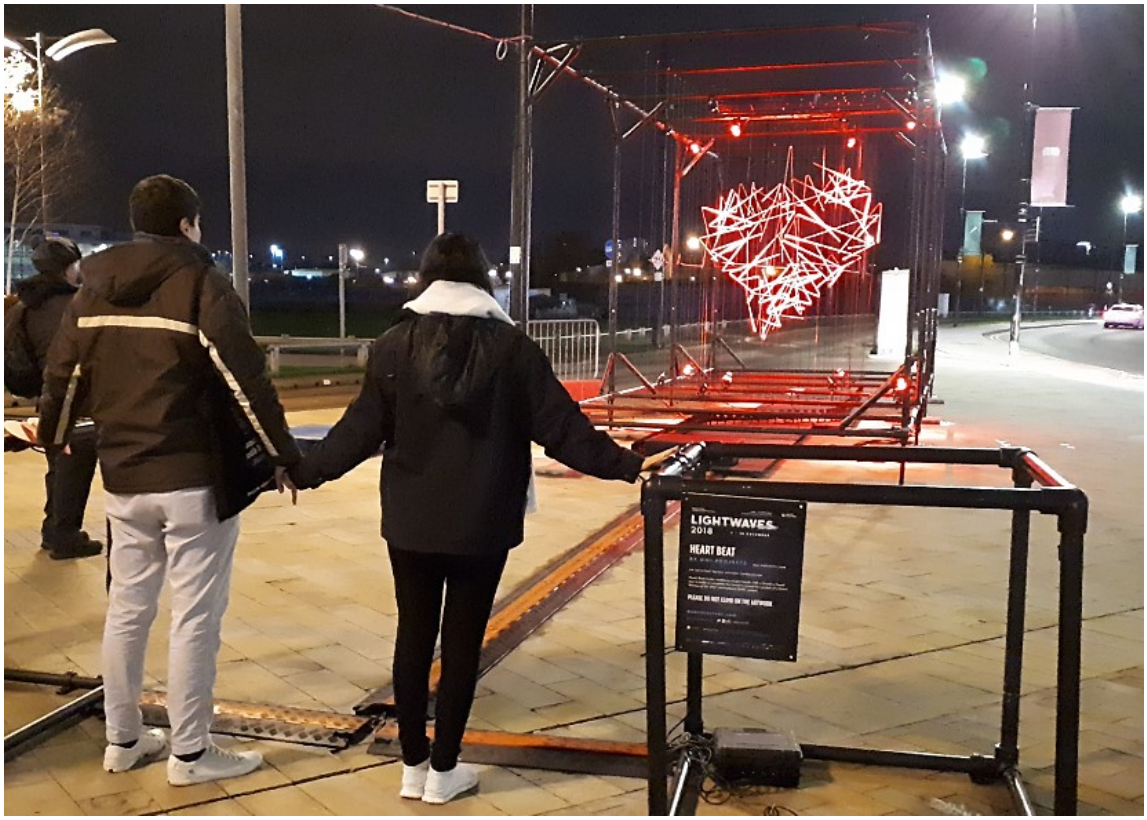


Fig. 6.34 The Heartbeat installation by GNI Project

6.3.2 Contextual Implications

Both digital interventions were applied around a focal point of the waterfront promenade which is usually busy of pedestrian flows and also integrates the circulation of vehicles and the tram line. However, this joint is only used as a transitional space and, although it includes some seating spaces, very rarely people sit and rest or stop by (fig.6.6).

The installation Relax & Release is located in a ‘dead’ placeless area defined by an inactive edge. The integration of the existing architectural elements of space (fence-wall) into the artwork was a critical feature of the intervention adding extra spatial and

contextual quality to the dialogue between the installations, the users and the public realm (fig.6.33). Furthermore, during the personal interview the member of the design team pointed out that through their installation they aimed to create a sense of destination and happening in public space by infusing it with vibrancy and human activity and, also, that the complete transformation a simple edge into a centre of activity can be an interesting challenge for an interactive designer (Int.D2).

As for the contextual aspect of the Heartbeat installation, Ingo Kalecinski from the design team emphasized on the significance of the scale compatibility between the installation and public space so that it will allow *"viewer to freely walk around our installation to fully experience those ever changing perspectives"* but at the same time without the installation seem 'lost' into its surrounding. He also highlighted that is important for the space surrounding the context to have a relatively low ambient light and colour level so that the installation can stand out, noting that through their installation they wanted to transform a 'dull' public space into a vivid focal point and make people spend time there and interact on the basis of the artwork (Int.D3). These surrounding context requirements were only partially met as the Heartbeat was placed at a location viewed from great distance also offering space to walk around it, however this space had almost no sense of enclosure and definition and normal to high light level (fig. 6.34, 6.35). However, being placed at a very focal location which concentrates views from multiple directions, it managed to change the visual landscape of the area and attract people to check it out as they were noticing the red light heart switching on and off, implying an active use and presence of people.

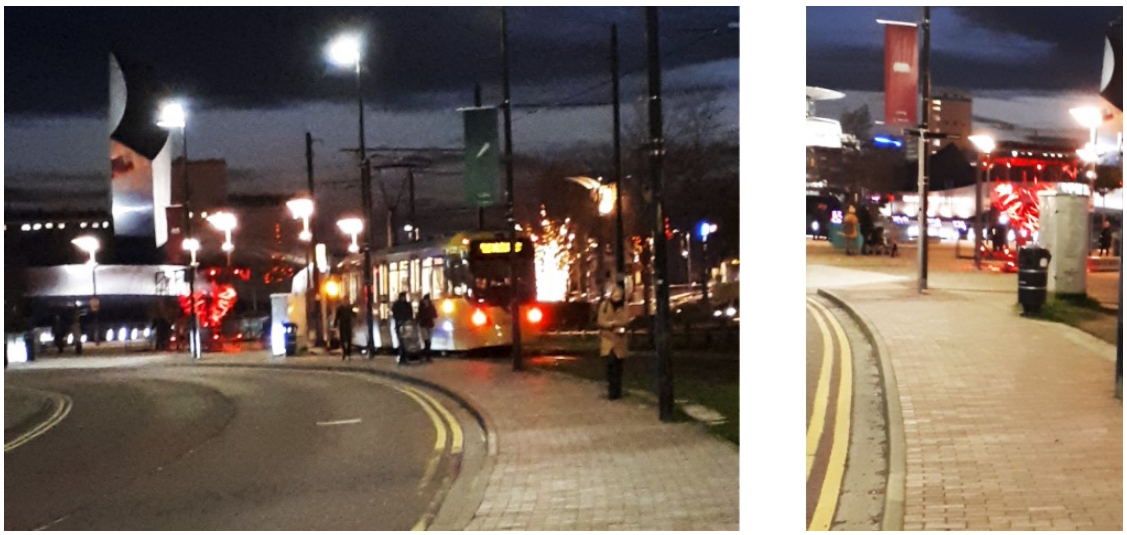
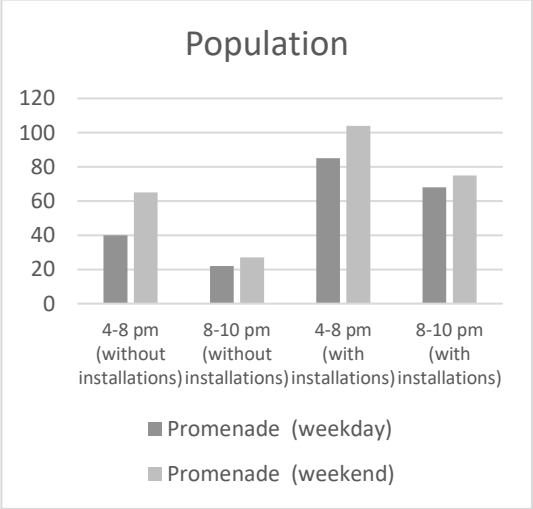


Fig. 6.35 Flashing red heart of the Heartbeat seen from distance implies human activity and triggers passenger's

curiocity

Date	(Average) Weather Conditions	Time Period of Analysis
Weekdays (10,11,12,13,14/12/2018)	5° (real feel 0°), Humid weather	4pm-10pm
Weekend (Saturday 8,9/12/2018)	4° (real feel -1°), Humid weather and periodic rain	

Table 6.6 Field observation data collection



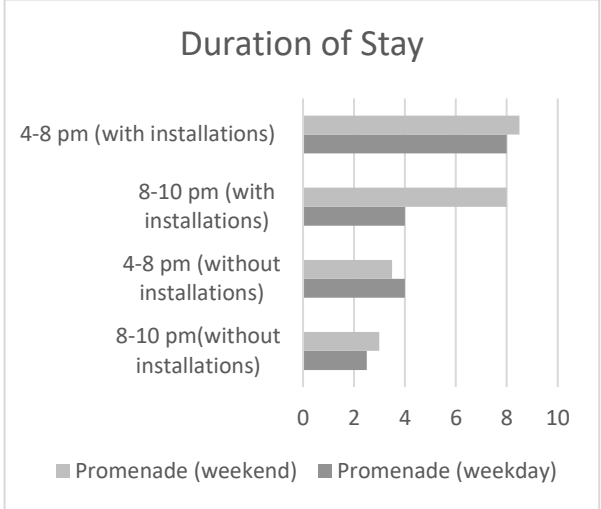


Fig. 6.36 (left) Comparing Promenade's average population in weekdays and weekends with and without the presence of the digital installations

Fig. 6.37 (right) Comparing average duration of stay at the Promenade with and without the installations

Ultimately, field observations showed that most of designers' intentions were attained successfully as, during the period of the installations' implementation, the area was transformed from a circulation node to a public space accommodating high levels of human activity. Particularly, population studies found that there was a 112% increase in total population in weekdays (4-8pm) and 60% (4-8pm) during weekend. Yet, the most remarkable increase (209%) was during the timeframe between 8-10pm on weekdays when the area is normally very quiet (fig.6.36). It is also important to notice here that the headcount mainly took place within the area of installations' influence (around 30m radius) and also across the steps of the promenade. That means that the overall population of the area could be 10-30% higher. Moreover, the duration of stay also showed a considerable increase, as it was found that people tended to stay at the area around 8 minutes and the main pedestrian flows were diverted towards the previously inactive façade of Relax & Release (fig.6.37). Particularly, it was found that people

tended to stay at the Heartbeat location 3 minutes on average, while at Relax and Release 5 minutes on average.

Interviews with event's staff who were also familiar with the area confirmed those findings by stating that the area is considerably busier in the evenings, especially on weekdays when the space is normally almost empty unless there is a performance at the Lowry theater. Particularly for the case of Reax and Release, it was mentioned that sometimes the space was so crowded that people did not have enough room to play with the installation; something that was considered as challenging (Interview with Jonas, member of event's staff, on 10/12/218- Int.S2 and Kitty, member of event's staff on 11/12/2018- Int.S3).

6.3.3 Social Encounters and Activity

'I believe our installation invites people to stop and play. Most of the public spaces are to pass by or just to chill on a bench but our installations offers a space to be active and playful as well as encouraging exchanges and connections with others'

Maria Almena, Kimatica Studio (Int.D2)

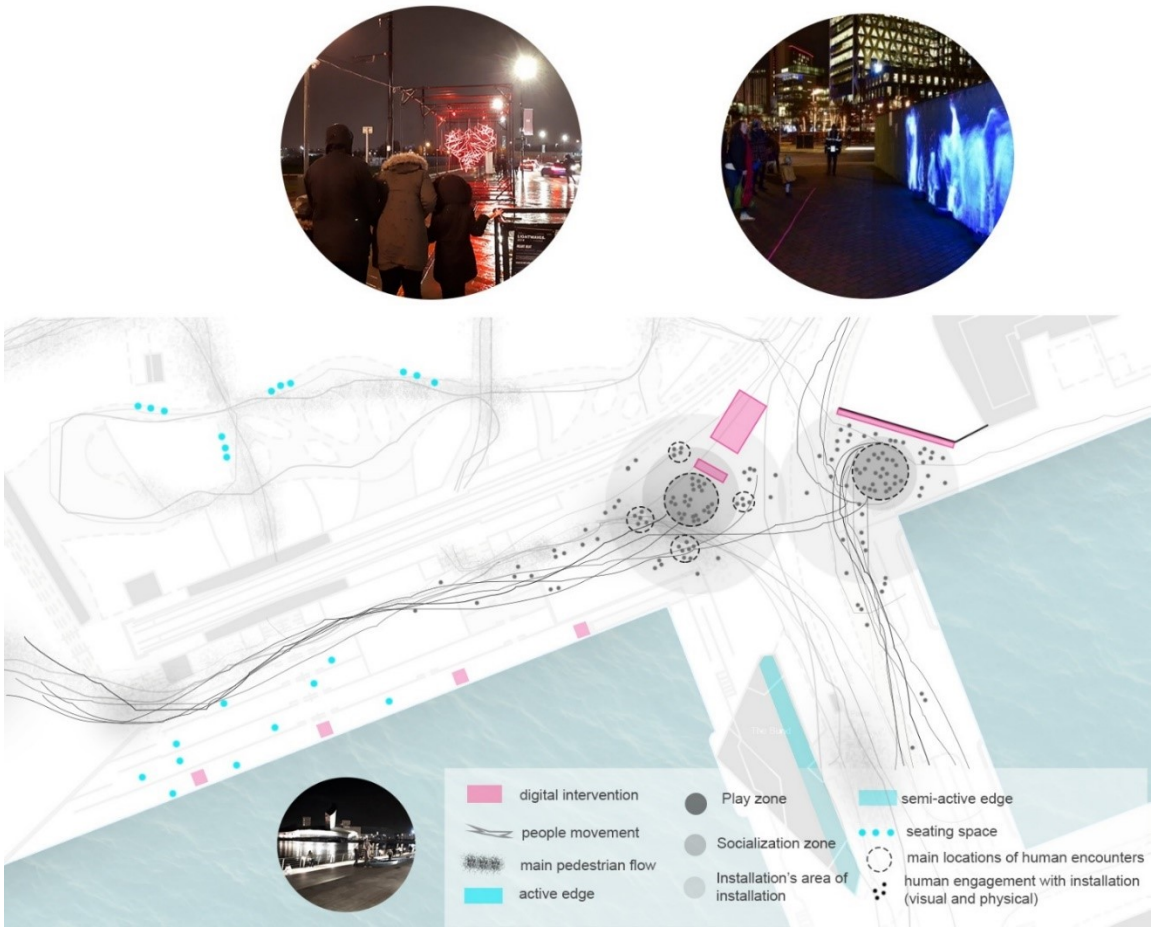


Fig.6.38 Site analysis of the Waterfront Promenade during the presence of the installations

According to Relax and Release's designers, one of their primary goals was users' connection through the share of dancing movements, and funny gestures. From their experience they had noticed that when engaging with such installations users gradually loosened up and become involved more actively to movement and at the same time get more open and extrovert. *"People always share something silly they do, either with people they know or with complete strangers! By moving all together they tend to feel more close to each other both physically and psychologically"* states the designer,

pointing out that through their installation they aimed to achieve the enhancement of social connection and community feelings through the immersion to a kinetic and sensory experience (Int. D2).

On the other hand, Heartbeat's function relies completely on human connection, since "once the connection is lost then the heart is broken into fragments again" (Titley, 2020: 1). Or, in the words of the designer, *"we wanted to bring people together and, most importantly, closer that they normally would"*, noting that they wanted to encourage intense traditional social interaction and physical connection through the function of their artwork (Int.D3).

As shown in figure 6.38 activities and interaction taking place within the waterfront promenade are primarily concentrated around these two installations, although a set of digital installation is also applied across the stepped terrace which also afford better views to the canal. The most critical observation here is that both of the digital interventions seemed to, indeed, challenge the of proxemics arousing unusual sense of closeness between strangers in open public space without at the same time causing any sense of discomfort. In the case of Heartbeat, people that were not entering the interaction zone as groups would co-operate with complete strangers from the queue or members of staff in order to light up the installation by joining their hands for some moments. In terms of Relax & Release, people were coming close sharing the space of the projecting wall in order to see their figures triggering interesting visual effects and creating altogether a form of group visual choreography. As the designers had predicted, a lot of times people were commenting of each other's gestures, laughing with them and sharing jokes. Both of the installations, greatly increased the feeling of vivid social activity in the area and transformed the state of high social distance to the deliberate sharing of personal and intimate space between people.

6.3.4 Perceptual Experience

According to the designers of The Heartbeat, the heart shape constitutes a powerful emotional symbol which, no matter positive or negative, it usually induces a strong feeling in the viewer. Furthermore, red colour and light can also evoke deep emotions, therefore with their installation they focused on encouraging users to 'contemplate or take some time for recollection' through the use of the red heart as well as the clever application of perspective and hidden symbolism (https://quaysculture.com/2016/10/interview-with-gni-projects-meet-the-team-behind-heart-beat/).

"We wanted to engage the viewer visually as well as conceptually. […] Each viewer can explore the artwork further by themselves in all its facets and discover its true meaning."

Ingo Kalecinski from GNI Project, 2019 (Int. D3)

Designers of Relax and Release point out that their idea involves the creation of an artwork out of human movement. Moreover, they consider very important the fact that this type of digital strategies offer opportunities to artists to exhibits their work to the public and also to people that wouldn't otherwise go to a gallery to get closer to (digital) art. In terms of the perceptual and social experience of public space, Maria Almena states:

"I believe our installation invites people to stop and play. Most of the public space are to pass by or just to chill on a bench but our installation offers a space to be active and playful as well as encouraging exchanges and connections with others"

(Int.D2)

Also she notes:

"Since the artwork's configuration is based on the human movement, the ultimate objective of the piece was to 'connect with the more emotional, abstract and magical aspects of the human body and mind"

(https://www.artinfluxlondon.com/kimatica-studio.html)

In terms of users' perceptual response through their walking patterns, the observational studies showed a significant drop (from 5.3 to 3.9 km/h) in people's walking pace as well as a sharp increase in the amount of people who performed engaging walking (from 30%

to 68%) showing a much higher interest for space exploration and discovery of installation's network (fig. 6.39).

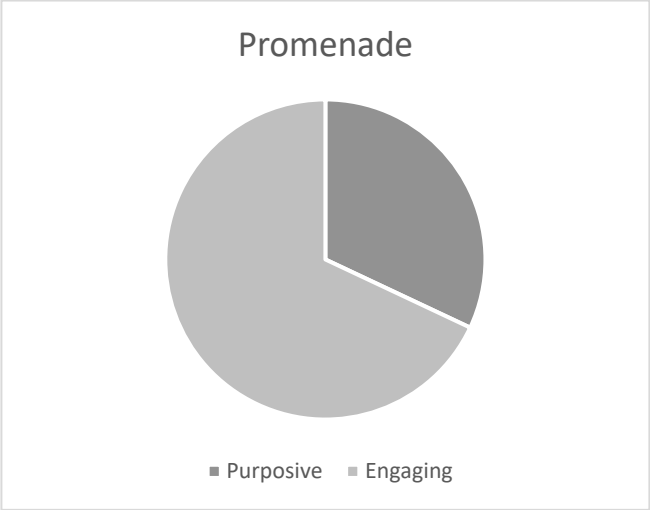


Fig. 6.39 Amount of purposive and engaging walking at the Promenade during the presence of installations
Fig. 6.40 Expressive moment during the engagement with the Heartbeat (https://radiantlights.co.uk/mailshot/sep-2017/print_emailer.html)

Kitty, a member of event's staff, during personal interview, pointed out that the nature of the installation seemed to be reflected on users' emotional reactions. So, for example, people interacting with Relax and Release seemed *"…excited, surprised and active through moving and talking all the time. They tend to laugh, speak loudly, jump and generally seem to have 'strong' feelings and reactions"*. However, during their interaction with the Heartbeat, people were described as *"affective and touched, with more soft and quiet reactions"* (Int.S3). Bethany, another member of event's staff, characterized people's emotional state during the engagement with Relax and Release as *"charmed, excited, happy and cheered up" (Int.S4)*, highlighting also that people jump into the interaction zone very quickly and easily without spending a lot of time to figure out how the installation works or observing the others. Working permanently on the gallery of Lowry theater, she also noted one very interesting observation;

> *"Elderly people seem to be far more confident and extroverted to interact with digital installations in the outdoor space rather than in the enclosed and formal space of a gallery, where maybe the feeling that are constantly observed or that may do 'something wrong' make them more hesitant, as they are less familiar with technology."*

Bethany, member of event's staff, personal interview, 12/12/2018, Int.S4

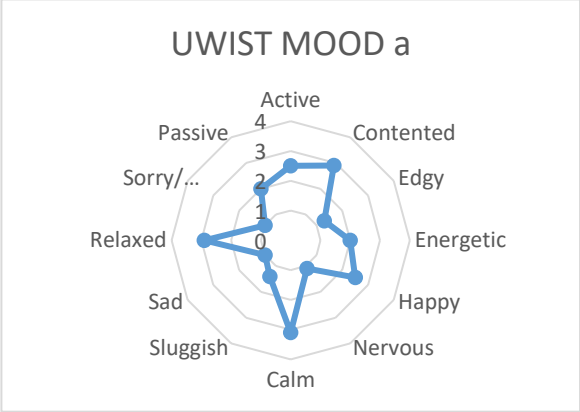
Self-reported data of users' emotional state after the engagement with both of the studied installations at the waterfront promenade, generally, confirm the aforementioned observations.

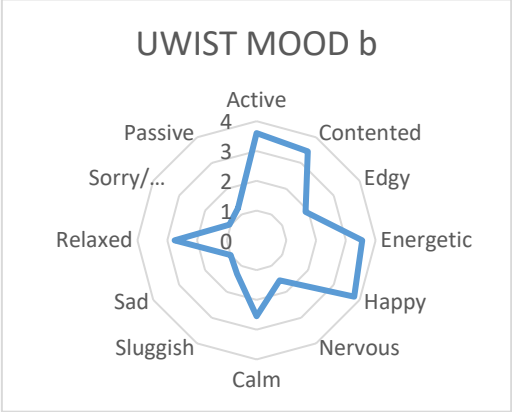
Restorativeness, Sociability and installation usability	**Mean Value**	Restorativeness, Sociability and installation usability	**Mean Value**
I feel **welcomed** in this place	1.75	I find this place **easy to socialize** and meet people	1.6
I feel ***safe*** in this place	1.15	There is ***much to explore and discover*** in this place	1.35
I find this place ***attractive and pleasant***	1.75	I found the installations ***easy to play with***	1.6

Table 6.7 Perceived level of restorative qualities of digitally augmented Waterfront Promenade

"Once I heard one person saying: 'Oh, my God! Yeahh!! That's awesome! This is the best experience in my life!!' " [for Relax n' Release installation]

Jonas, 25, staff member, Int. S2





Energetic arousal: active, energetic, sluggish, passive

Tense arousal (i.e stress): edgy, nervous, calm, relaxed

Hedonic tone (i.e. happiness): contented, happy, sad, sorry

Fig. 6.41 (left) Self-reported UWIST MOOD after the engagement with the Heartbeat
Fig. 6.42 (right) Self-reported UWIST MOOD after the engagement with Relax n' Release

From the 20 experiment participants, 10 of them interacted with the Heartbeat first while and 10 them reacted with Relax and Release first as two different route patterns were followed in order to address concerns about order effects as noted in the previous chapter. Certain variations in the results of the psychometrics tests between two groups can also be identified. For the group that completed their test right after the interaction with Relax and Release , it was found that this experience had a statistically significant

and positive effect of on Hedonic tone and energetic arousal with higher mean value regarding feelings of happiness, contentment, being energetic and active (fig.6.42). On the other hand, the group that completed their tests after the interaction with the Heartbeat reported more intense feelings of relaxation, calmness and contentment (fig. 6.41). Furthermore, in terms of area's perceived restorativeness and sociability, figures here are considerably higher than the Plaza, with most highly rated values the ones that have to do with the level of welcomeness of space as well as its perceived degree of attractivity and pleasant image (table 6.7).

6.4 'Spectrum' at the Enclosed Square

6.4.1 Installation Design and Concept

The installation implemented and studied at the Enclosed Square (Lowry square), during LightWaves 2018 event, was the interactive installation Spectrum designed by the Canadian creative collaborative HUB Studio (fig.6.43). The main scope of the projects of this team of interaction and creative designers involves the creation and direction of 'meaningful multi-sensory experiences' for performances and public spaces. Furthermore, though the adoption of a 'theatrical approach', one of their key concepts it to 'make the world as a stage' (https://www.hubstudio.co/about)

Spectrum is a multi-sensory interactive installation that converts the sound movement into light. Consisting of 14 large hoops the main idea of the installation is to invite people to engage with it by talking to it and making sounds that travel from one side of the piece to the other, activating the light in the hoops. Particularly, once the sounds are made or the words are spoken, users can see and hear their travelling messages through light movement that represents the soundscape. Very important feature of the installation is that this form of visualization of communication operates from both sides of the artwork, due to the existence of two sensors, making it possible for users to create dialogue through the installation. Essentially, according to the event's curators as well as the designers, Spectrum shows "how we ourselves communicate, and how we decode data with multiple sensors" (http://thequays.org.uk/whats-on/lightwaves-2018/). Interestingly, by reacting to the sound of the city and citizens this installation managed to convert the Lowry Square from a standard plaza during the day into an active and engaging public space during the night.

Fig. 6.43 Spectrum Installation by HUB Studio at the Enclosed Square

6.4.2 Contextual Implications

The installation which extends 14.60m long, 1m wide and 1.83m high was placed in the middle of the enclosed square, aligning with an existing paving line which points the entrance of the shopping mall from one side and the entrance of Lowry Theatre from the other side (fig. 6.43). As found through site analysis, this part of the square, although forms a busy transition point for large numbers of passengers by integrating multiple routes and accessed, affords very limited opportunities to stay; both in terms of seating but, most importantly in terms of active use.

Spectrum's interface, scale as well as its strategic location were planned so someone could realize that something takes place from a distance and then approach. According to the designers, it was very important for them to transform to a certain extent the acoustic and visual landscape of public space through their artwork which visualizes communication by transforming of voice into light (Gonzalo Soldi from HUB Studio, personal interview, 15/2/2019, Int.D4). During the interview, the designer also highlighted the critical role of technology on the enhancement of traditional urban dynamics and noted that t was crucial for them to show their emphasis on human communication and public space transformation through people's connection:

"It was significant for us that people will realize how a piece of art can change their everyday routine and how public space can ultimately change by a low-scale intervention"

Gonzalo Soldi, HUB Studio, Int. D4

Furthermore, he pointed out that with Spectrum as with most of their artworks they see public space as a stage of performance and also as a space to pass their messages; in this case, their message regarding the importance of human communication. Finally, they also aimed to bring people to technology and interactive artworks that are not particularly familiar with them (Int.D4).

As it appears from field observations data, a critical increase in areas population was observed, especially during the timeframe from 4pm-8pm both on weekdays and weekends (fig.6.44); 213% and 150% respectively. Furthermore, the primary pedestrian flows were slightly reorganized by being concentrated mostly at the centre of the square rather than the edges (fig.6.46). The average duration of stay also increased, yet not massively. As it is also illustrated in figure 6.45 the greatest increase refers to the duration of frame during the time period form 8pm to 10pm both in weekdays as well as weekends.

Date	(Average) Weather Conditions	Time Period of Analysis
Weekdays (10,11,12,13,14/12/2018)	5° (real feel 0°), Humid weather	4pm-10pm
Weekend (Saturday 8,9/12/2018)	4° (real feel -1°), Humid weather and periodic rain	

Table 6.8 Field observation data collection

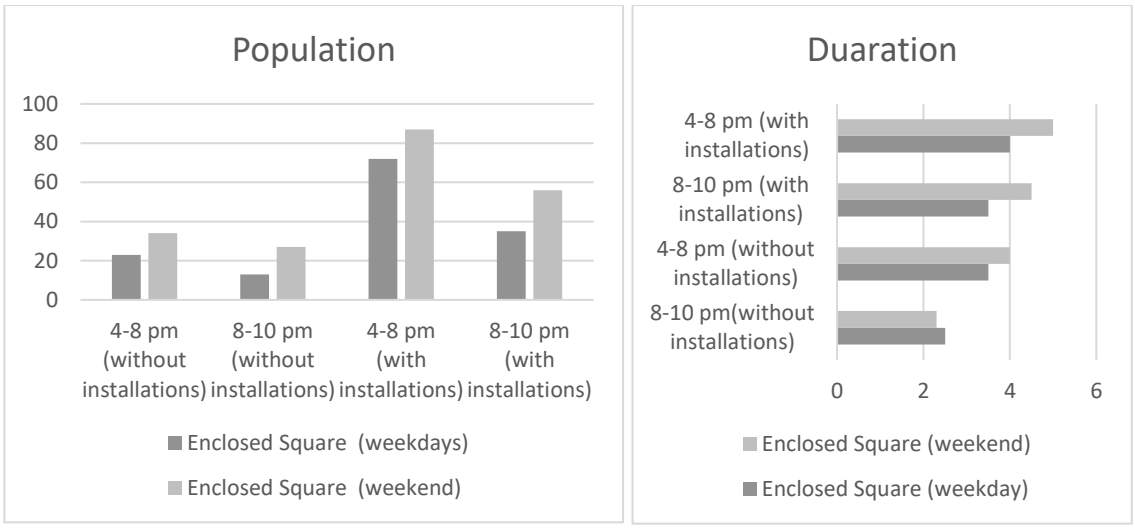


Fig. 6.44 (left) Comparing Enclosed Square's average population in weekdays and weekends with and without the presence of the digital installations

Fig. 6.45 (right) Comparing average duration of stay at the Enclosed Square with and without the installations

6.4.3 Social Encounters and Activity

The enhancement of social connectedness and activity in public space is the key element in Spectrum's concept as it involves users are coming closer by talking and sharing the visual effects of their communication. Furthermore, as Gonzalo Soldi emphasized, it was significant for them that the design of the installation, although technologically advanced, would act as a tool to promote and illustrate the traditional analog forms of communication between people (talking and bodily expression) rather than encouraging connections through internet, media and technology which often tend to isolate people physically. Their digital artwork would physically manifest and symbolize the answer to 'smartphone based human interaction' (Int.D4).

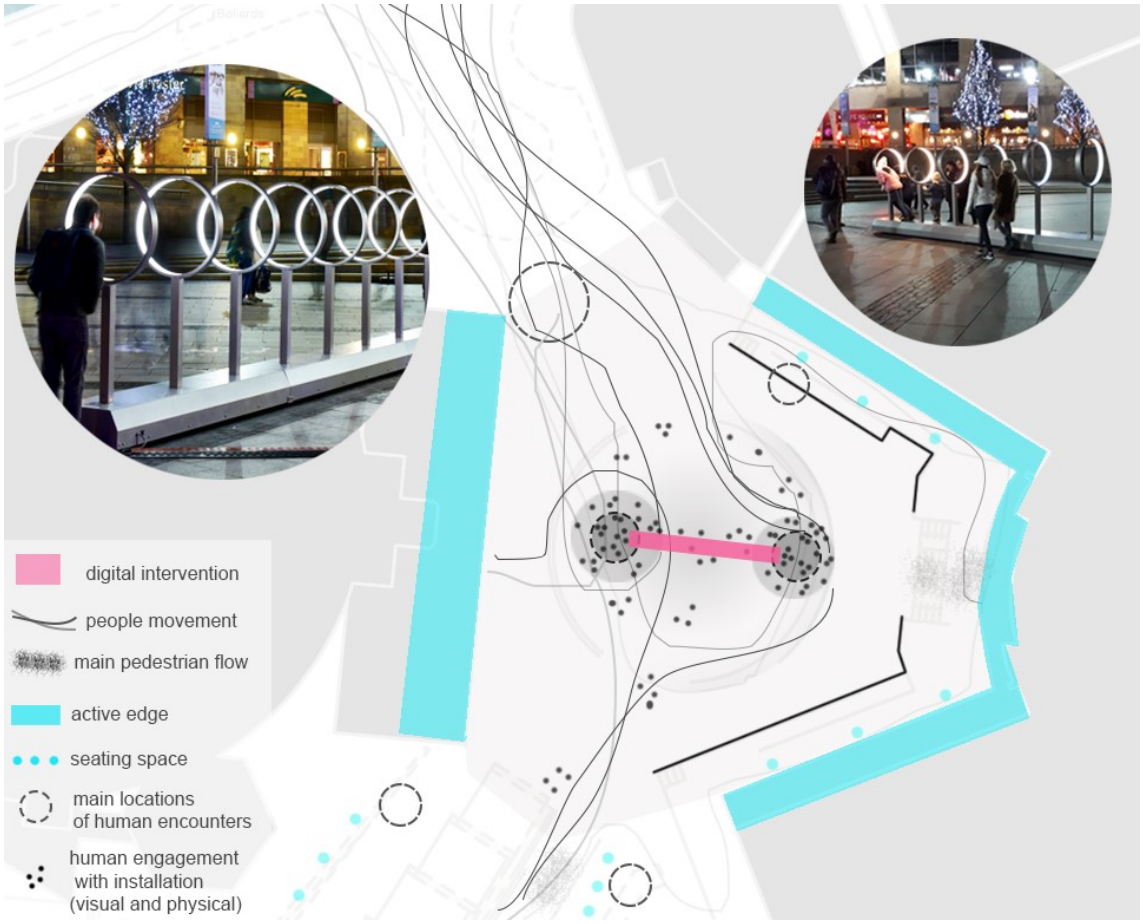


Fig. 6.46 Site analysis of the Enclosed Square during the presence of the installation

As shown in figure 6.46, the major interactive points of the enclosed square are now the two poles of the Spectrum, were most of the time large human encounters consisting of 3-8 people (strangers and not strangers) were standing ready to share a word, sound or expression to the human encounter of the opposite side and see their voice triggering the interesting visual effects. This form of playful performance attracted and triggered even more human encounters who were standing within the greater socialization zone, watching the act and commenting on it with other people from their own or adjacent groups. However, as member of the staff member noted during personal interview, the place was some specific times ‘packed’ by kids and that made it less appealing to young people who wanted to share their performance with people closer to them (Int.S4).

6.4.4 Perceptual Experience

"Allow yourself to scream in a plaza, allow yourself to play. […] Watch as your message moves from one end of the circles to the other. You will see how small gestures – invisible reverberations – can have a big impact."

Gonzalo Soldi, HUB Studio, Int.D4

Fig. 6.47 Self-expression through the engagement with Spectrum (https://www.hubstudio.co/works/spectrum-en)

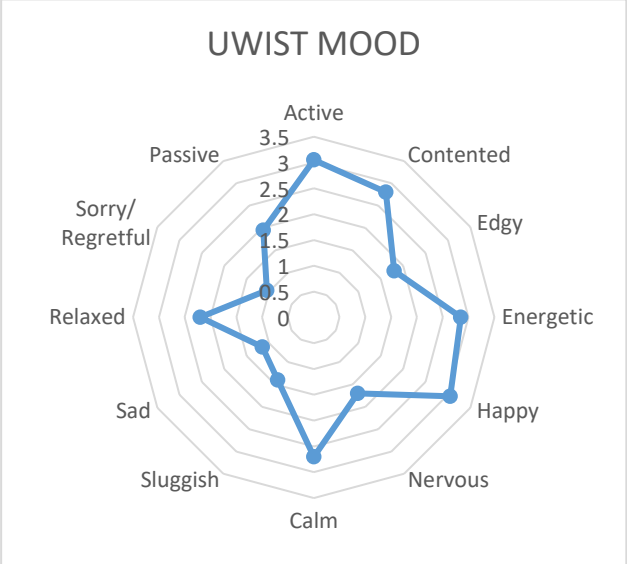
In terms of individual perceptual experience, the designer admitted that their initial intent mainly involved the stimulation of sensory and bodily experiences to people through feelings of sound vibrations, light and colour. However, after the first day of the application they realized that the installation had much more to offer, as its major contribution for them was the fact that people gradually loosened up, felt less shy and more expressive. *"Even by just a scream is a relief"* (fig.6.47).

Therefore, although, this artwork started as an interactive and playful piece to convey primarily social messages about human interaction and community connectedness, they

design team now considers it as a strong experiential piece that also encourages people to momentarily 'unwind' and 'brighten', especially in Northern contexts during winter where, they have noticed, people tend to be more stress and introverted (Int.D4).

The observational studies identified a number of positive emotional reactions related to the interaction with Spectrum by people of all ages. People used to laugh and smile during their engagement, climb on it and, generally, try to explore it also physically and, ultimately they looked amused and cheerful. However they did not stay at the interaction zone for more than 3.5 minutes on average. These emotions were also confirmed by the self-reported mood surveys which show high mean value in feelings regarding perceived happiness (hedonic tone) and energetic arousal (fig.6.48). Yet, sense of exploration and discovery seemed to be relatively low in that area, something which is possibly related to its compact size, high level of enclosure and well-defined free views which allow for limited visual articulation and cues.

Restorativeness, sociability and usability	**Mean Value**
I feel **welcomed** in this place	1.15
I feel ***safe*** in this place	1.5
I find this place ***attractive and pleasant***	**0.95**
I find this place **easy to socialize** and meet people	1.05
There is ***much to explore and discover*** in this place	**0.3**
I found the installations ***easy*** **to play with**	1.65



Energetic arousal: active, energetic, sluggish, passive

Tense arousal (i.e stress): edgy, nervous, calm, relaxed

Hedonic tone (i.e. happiness): contented, happy, sad, sorry

Table 6.9 (left) Perceived level of restorative qualities of digitally augmented Enclosed Square
Fig. 6.48 (right) Self-reported UWIST MOOD after the engagement with Spectrum

Users' walking patterns also agree with the aforementioned result as the walking pace shows a considerable decrease from 5.2 to 4.4 km/h with a higher amount of people performing engaging walking (59%) (Fig.6.49).

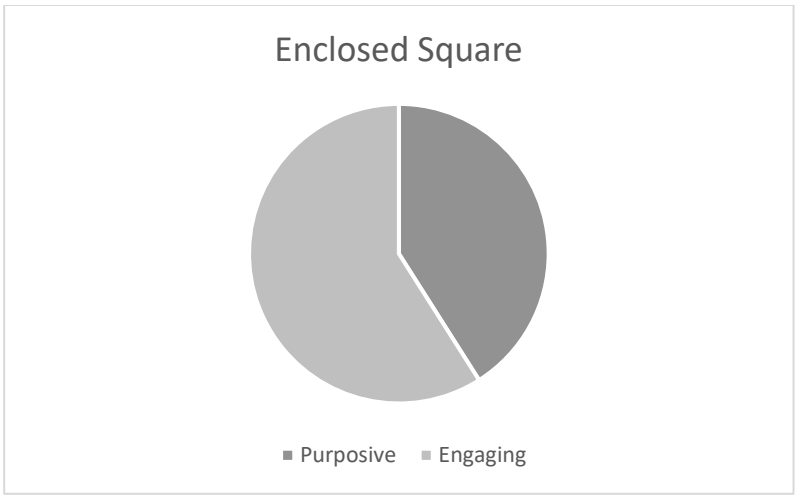


Fig. 6.49 (left) Amount of purposive and engaging walking at the Enclosed Square during the presence of installations

Fig. 6.50 (right) Playful moments during engagement with Spectrum (https://www.instagram.com/explore/tags/lightwaves2018/?hl=el)

6. 5. Gardens Illuminations

6.5.1 Installation Design and Concept

The Gardens did not accommodate any large-scale interactive installation, but instead they facilitated a number of 'treelike' digital light installations lined along the central longitudinal path of the public space (fig.6.51). These LED structures, however, managed to transform the nighttime look and ambience of the area, with light being used here as a powerful tool to create a certain 'warm' atmosphere of place. Furthermore, being located on the most busy path of the public space and integrating a number of seating areas and creating dialogue with the existing landscape, these illuminated 'trees' act as a background for the human activity after dark, without though affording any further opportunity for interaction. The main positive feature of these non-interactive light installations is their ability to *"effortlessly alter spaces, allowing designers to play with shades, colour and intensities"* (ARUP, 2015: 23)

Fig. 6.51 'Tree-like' light installations at the Gardens

6.5.2 Contextual Implications

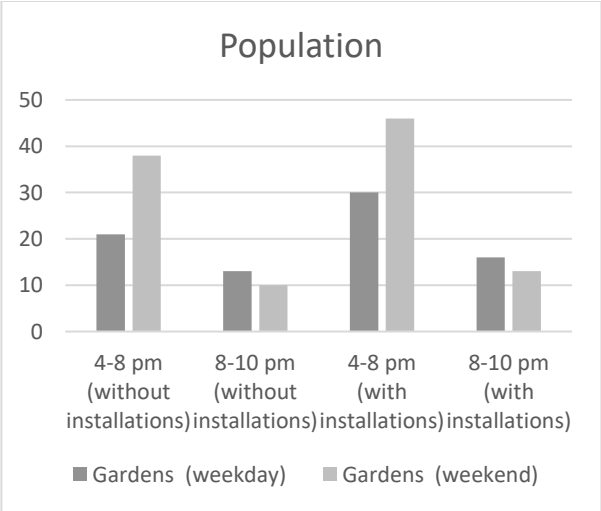
"Light has the power to completely change the experience of a place"

—Francesco Anselmo, Lighting Designer and Technologist, 2015

Garden's light installations managed to transform the night-time environment of the public space by adding new lighting features which increased visibility on the primary pathway, created extra visual interest, increased contrast with the surrounding and facilitating an overall more 'warm and cozy' experience. However, the observational studies before and during the implementation of the illuminations showed only slight differentiations in terms of the occupancy of the space, movement patterns throughout the area, and generally the use of space after dark comparing to the rest of spaces studied.

Date	(Average) Weather Conditions	Time Period of Analysis
Weekdays (10,11,12,13,14/12/2018)	5° (real feel 0°), Humid weather	4pm-10pm
Weekend (Saturday 8,9/12/2018)	4° (real feel -1°), Humid weather and periodic rain	

Table 6.10 Field observation data collection



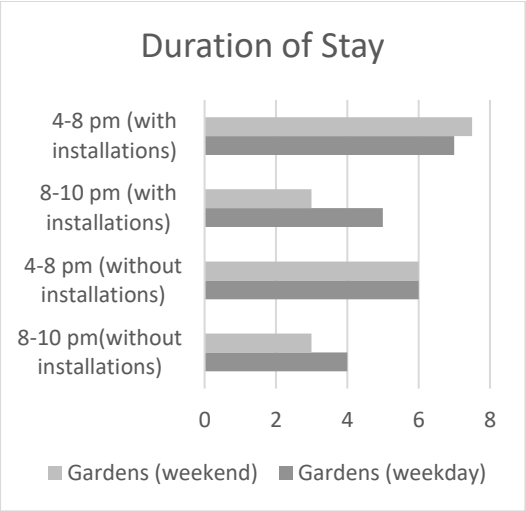


Fig. 6.52 (left) (left) Comparing Gardens' average population in weekdays and weekends with and without the presence of the digital installations

Fig. 6.53 (right) Comparing average duration of stay at the Gardens with and without the installations

Particularly, the population increase in weekdays in the timeframe from 4pm-8pm was 43% while in weekends 22%; for the timeframe 8-10 pm when the area is mostly quiet and not particularly populated, the increase was around 25% throughout the whole week (fig. 6.52). This pattern of increase is similar for the duration of stay as well. The gardens being the public space with the highest figures of duration of stay in the area before the implementation of the installation, maintained similar stays during the presence of the illuminations (+16-20%) during the entire timeframe from 4pm-10pm (fig. 6.53). However the main contextual transformation refers to the locations that people chose to stay, which in the second phase of observations included the areas around the illuminations (fig. 6.54), whereas before the implementation of the illuminations the visitors were more evenly distributed across the park (fig.6.19).

6.5.3 Social Encounters and Activity

"Event gives the opportunity to people to talk more openly to each other when they engage with an installation or when they observe others doing it or very usually when they try to locate it on the map or app; it's like they share a common experience that brings them closer, like following a trail or playing a group game"

Interview with Carol, event's staff member and installation supervisor manager, 13.12.2018 (Int.S5)

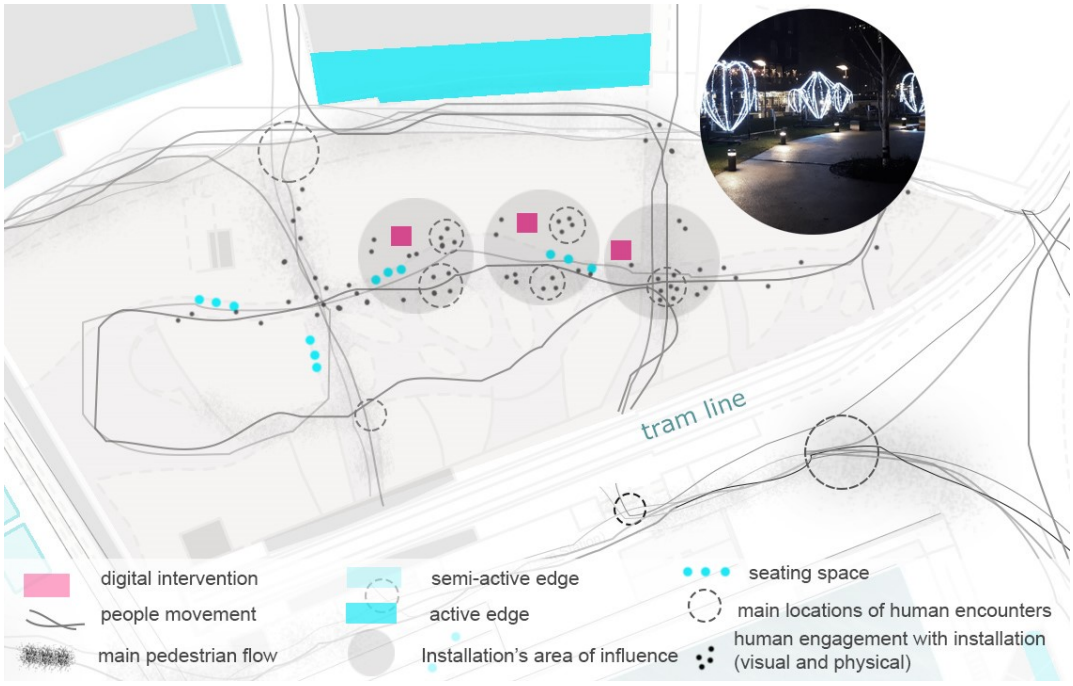


Fig.6.54 Site analysis of the Gardens during the presence of the installation

As Carol, installation supervisor manager, noted during the event people seemed to openly talk to each other in light of the physical or visual engagement with the installations. In that sense, Garden's illuminations located at a critical part of MediaCity's urban space managed to facilitate collective interaction encouraging a more social behaviour and pleasant atmosphere at this space, although the installations themselves did not directly address play and joyfulness as ways to motivate interaction (Int.S5).

As shown in figure 6.54, the installations were placed along the main pathway of the Gardens, in between busy routes of movement and entrance to the site, and therefore the area can be considered as a dynamic and digitally enhanced meeting point for people walking passing by bike. The physicality, location and operation of the installation mainly encouraged small human encounters, consisting of 2-4 people, which engaged either in highly close proximity with the illuminations (fig. 6.55) or rested at the benches located at the wider area of influence observing the interesting visual effects.

Fig.6.55 People engaging in very close proximity to the installation

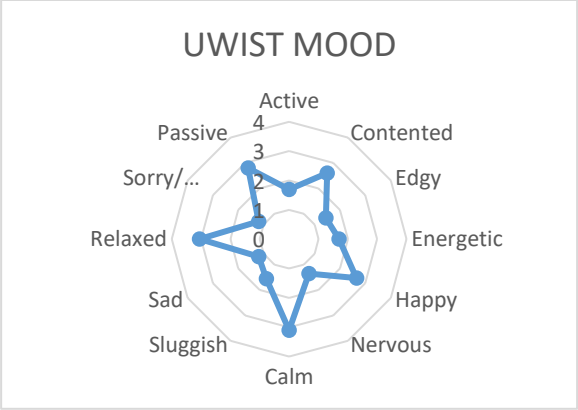
6.5.4 Perceptual Experience

The observational studies on people's perceptual response to the digitally enhanced public pace of the Gardens found a relative improvement in their experience, yet those variations were not great comparing to the rest of public spaces studied. People seemed charmed and attracted by the lights and were also keen to explore their form physically by entering quite deep into the direct influence zone, observing and exploring them (fig. 6.55). However, the duration of that direct engagement did not last more than 2 minutes as the installations did not afford any interactive features; yet, most of the people used to stay a few minutes more at the area to enjoy the overall atmosphere. In terms of the self-reported feelings, as shown in figure 6.56, the users reported high levels of hedonic tone at the area (high mean value in 'happy' and 'contented') and low levels of stress by reporting increased feelings of 'calmness' and 'relaxation', something which can be also associated with the restorative effect of the natural features of the gardens (Kaplan and Kaplan, 1995). Finally, in terms of energetic arousal, people at that space tended to feel less energetic with descriptions as 'passive' gaining high value in their responses.

Regarding the user's evaluation of perceived restorativeness, and sociability of place, the Gardens showed increased mean values in terms of terms of the space's attractivity, welcomeness and sense of exploration however people did not find this place particularly easy to socialize with others (table 6.11).

Restorativeness, sociability and usability	Mean Value
I feel **welcomed** in this place	1.5
I feel ***safe*** in this place	0.4
I find this place ***attractive and pleasant***	**1.85**
I find this place **easy to socialize** and meet people	**-0.15**
There is ***much to explore and discover*** in this place	1.2
I found the installations ***easy to play with****	0

*there were no interactive installations so the predetermined value was 0



Energetic arousal: active, energetic, sluggish, passive

Tense arousal (i.e stress): edgy, nervous, calm, relaxed

Hedonic tone (i.e. happiness): contented, happy, sad, sorry

Table 6.11 (left) Perceived level of restorative qualities of digitally augmented Gardens
Fig. 6.56 (right) Self-reported UWIST MOOD after the engagement with Spectrum

Users' walking patterns confirm the aforementioned results which do not imply great differentiations to user's experience in comparison to the previous state of the area, as the walking pace dropped from 4.5 to 4 km/h and the amount of engaging walking increased from 43 to 54% (fig.6.57, 6.58).

Fig. 6.57 Amount of purposive and engaging walking at the Gardens during the presence of installations
Fig. 6.58 People strolling around the digitally augmented Gardens

CHAPTER 7

Further Data Analysis and Cross Analysis

This part of the research study forms a further integrative analysis of all previously assessed digital installations and public spaces. This in-depth analysis involves data deriving from interviews with experts, professionals, designers, stakeholders as well as with event's participants. This set of data is also combined and triangulated with patterns identified from the first stage of analysis as well as from the rest of data sources. Therefore, this part of data analysis can be considered as a more holistic and comprehensive move towards the appreciation of all research work in one explicit approach. To achieve that, rather than examining the embedded case study units separately as done in the first part of analysis, this part of the study will follow a cross-unit analytical framework which aims to evaluate the shared or similar concepts and themes that emerge from different cases and different data sources.

As a key aim of this study is to assess the human experience in digitally enhanced places from three major featuring perspectives, this comprehensive analysis will also seek to identify the synchronized experiential aspects of urban digital interventions in all the three dimensions. It is also significant to denote how these aspects can be associated to promote positive place experience and a state of psychological and social wellbeing in public space. Therefore, for the organization and evaluation of key themes and concepts arising from the data analysis, the three-fold idea of place experience will constitute the basis of the analytical framework.

7.1 Context and Installations

Digital media can be used to annotate urban spaces with people's everyday stories and lived experiences. How does this temporal inscription of place change they way we see and interact with the urban environment? Can digital media be designed as 'plug ins' to the existing city, make the usage of existing urban structures more efficient and personalized or extend and deepen their experience?

7.1.1 Changes in Urban Dynamics and Public Space Activation

The most prominent pattern during the observational field studies as well as one of the most common themes in most sets of interviews was the concept of (re)activation and revitalization of public space through the application of media interventions. As noted before, the observations showed a considerable increase in all public spaces' population as well as duration of stay. The following figures illustrate the variations in the population of each site during the late afternoon and evening hours before and during the implementation of the digital installations, suggesting how this form of digital enhancement managed to draw large numbers of people who decide to spend time in the area.

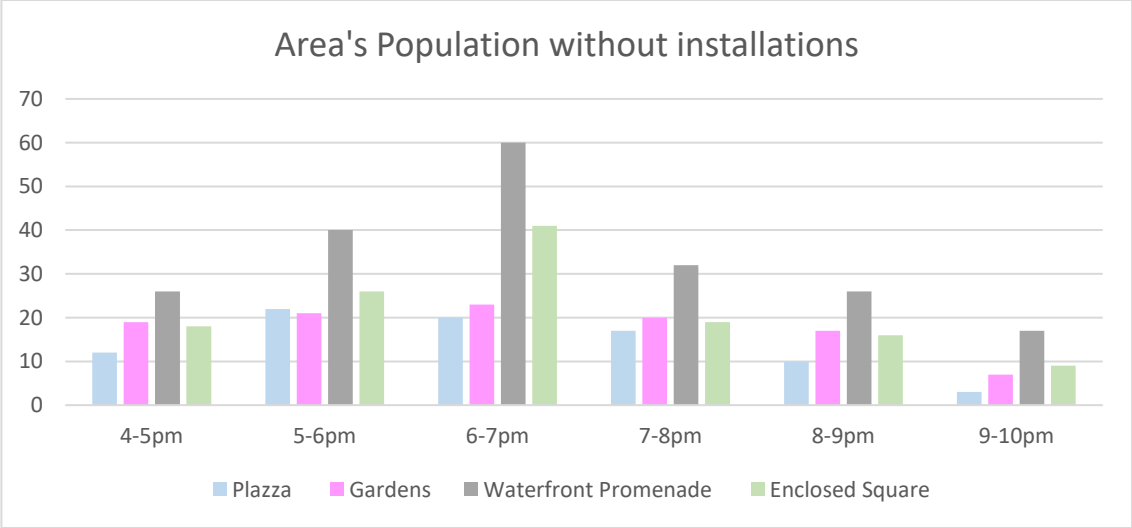


Fig. 7.1 Comparative bar graph showing average population from 4-10 pm in all public spaces without the presence of the digital installations

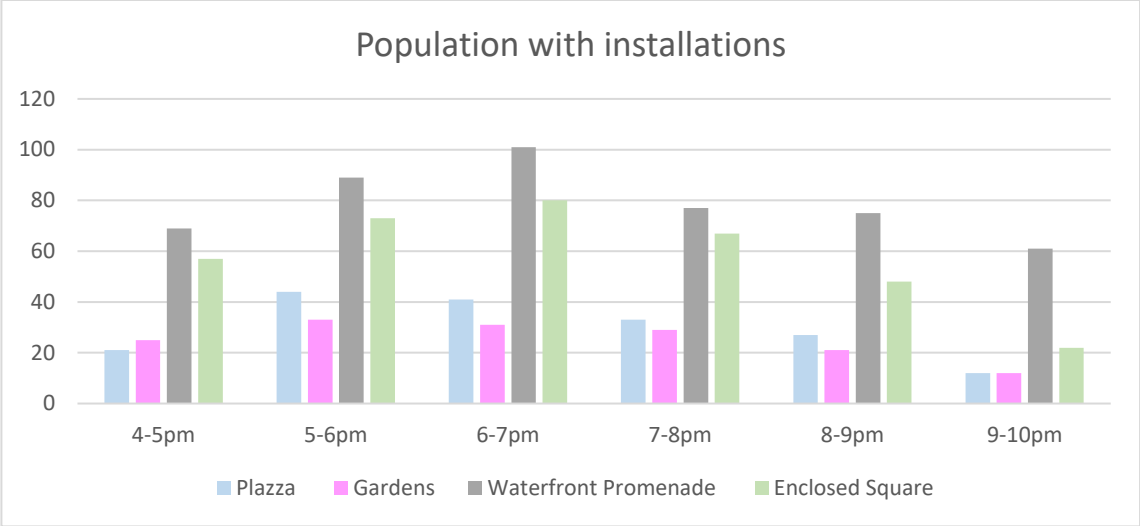


Fig. 7.2 Comparative bar graph showing average population from 4-10 pm in all public spaces during the presence of the digital installations

It is significant to be mentioned here, once more, that during the application of the digital interventions at Mediacity's UK public realm, there was no additional public space intervention that could act as an urban people attractor such as food stalls, performances or happenings. Therefore, the main reason for all transformations in local public life and urban dynamics is considered to be the digital enhancement of the area (fig. 7.1-7.2).

Comparing the population change of all different public spaces it can be observed that the general population pattern has mainly remained the same (waterfront promenade highly populated- while Plaza less populated), yet all figures have been significantly augmented during the period of the installations' presence. The area which has been less affected by its digital enhancement in terms of public life is the Gardens.

Data from the periodic scans of all public spaces before and after the application of the digital installations also showed important changes not only in terms of the quantity of the population but also the quality. Particularly, during the initial site analysis the majority of site's users was workers and students from the area, with the age group 20-55 years covering more than 70%, a figure than fundamentally changed during the presence of the installations (table 7.1).

"It is free and attracts a broad demographic, bringing people from all ages and backgrounds together to experience something special"

Jennifer Taylor, Quays Culture, Int.C1

The creation of public space that encourages social integration and high mix of people was, also, mentioned as one of the main objectives of LightWaves event according to the curators (Interview with J. Taylor, Quays Culture, 15/4/2019, Int.C1). Indeed, as can be also seen in the table below, ethnographic studies found a much more equal distribution of age groups in the period that the digital event took place.

Age Group Distribution	0-18 years	18-55 years	Over 60 years
Without the Installations	18%	72%	10%
With the Installations	34%	44%	22%

Table 7.1 Age group distribution in the area with and without the digital installations

a. Space animation and creation new destinations in the city

The aspects discussed above overlap with a concept- theme commonly recurring in most of the interviews conducted for this research study. Particularly, the idea often mentioned by the curators and sponsors of the event as well as from urban designers and installation designers was that of *space animation* and *creation of new destinations in the city.*

Space animation refers to “the deliberate, usually temporary, employment of festivals, events, programmed activities, or pop-up leisure to transform, enliven, and/or alter public spaces and stage urban life” (Glover, 2019: 1). Therefore, examples of public space animation can involve art installations, urban equipment, pop-up tactics such as markets, stalls and performances as well as all forms of interactive digital interventions.

The idea of space animation through the application of creative digital interventions becomes even more critical when associated with people’s perception of the area. As noted in the previous chapter (table 6.2, 6.3), two very common descriptions of the space by the users was ‘quiet’ and ‘cold’. Furthermore, the three major problems highlighted by them regarding the site were a. the lack of vibrancy and activity, b. the lack of human scale and c. the lack of character and identity, with the first two considered as those of the highest importance by them.

In that sense, the interviewed urban designer highlights the significance of space transformation from being empty and inactive to accommodating an active use and entertaining atmosphere through the implementation of media art interventions. She,

also, pointed out the potential of this form of interventions to convert public space into a 'play area for all' which subsequently introduces new ways to interact with and experience space (Interview with M. Kekeri, Avison Young, 12/3/2019, Int.UD1)

> *'People are given the opportunity to see the city from a different perspective, to explore it, to re-discover it. Art transforms the city which can now be seen as a place/way of entertainment and not only the area that we work at or do our shopping.'*

Michaela Kekeri, Urban Designer, Int.UD1

In the same context, event's curators and sponsors advocate the idea that by staging temporary urban happenings like this can animate public spaces and promote city identities. They believe that when such creative and interactive interventions take over city's streets and squares they give citizens additional reasons to come out and spend some time in a vibrant and novel environment (Int. C1 and Interview with James Whittaker , Peel Group, 05/04/2019, Int.SP1).

> *"The vision is to animate public space and increase enjoyment of the area, introducing people to world-class contemporary art in a playful and accessible context."*

Jennifer Taylor, Quays Culture, Int.C1

On-site discussions with people during the 10-day period of the installations' implementation confirmed these statements, as one of the main positive impressions mentioned by them was the area's 'liveliness', 'vibrancy' and 'busyness' (91%). People, also, often mentioned that they wanted to 'discover' all different digital interventions distributed in the area and, thus, citizens holding event's maps or navigating the area through the event's app was a rather usual field observation (fig.7.3, 7.4). **The explorative nature of this digital strategy can be also linked with the idea of creating multiple destinations as part of the placemaking process which was introduced in chapter 2.**


Fig.7.3, 7.4 People using event's maps to navigate the digitally enhanced area and discover all implemented installations

"It's a cheerful experience in the city offering lots of different choices and, most importantly, it doesn't involve any money transaction. Free human experiences like this are getting rarer and rarer in the modern society"

Conor, 28, user

The incorporation of new active use in public space was a concept also supported by all the installation designers. Particularly, during the personal interviews conducted for this study all the artists emphasized that they sought to create a new activity for the citizens by trying to embed the user into the artwork and, thus, making it even appealing to them and give them the incentive to discover it. In Youth Culture, for example, people can see there faces projected in the screens incorporated into the digital sculpture, while in Spectrum people can witness their voice becoming lightwaves (Interviews D1, D2, D3, D4). By utilizing the audience as a part of this bigger participatory spectacle (Int.D1) the media artists wished to draw more people in the area and get them involved in this novel digital experience.

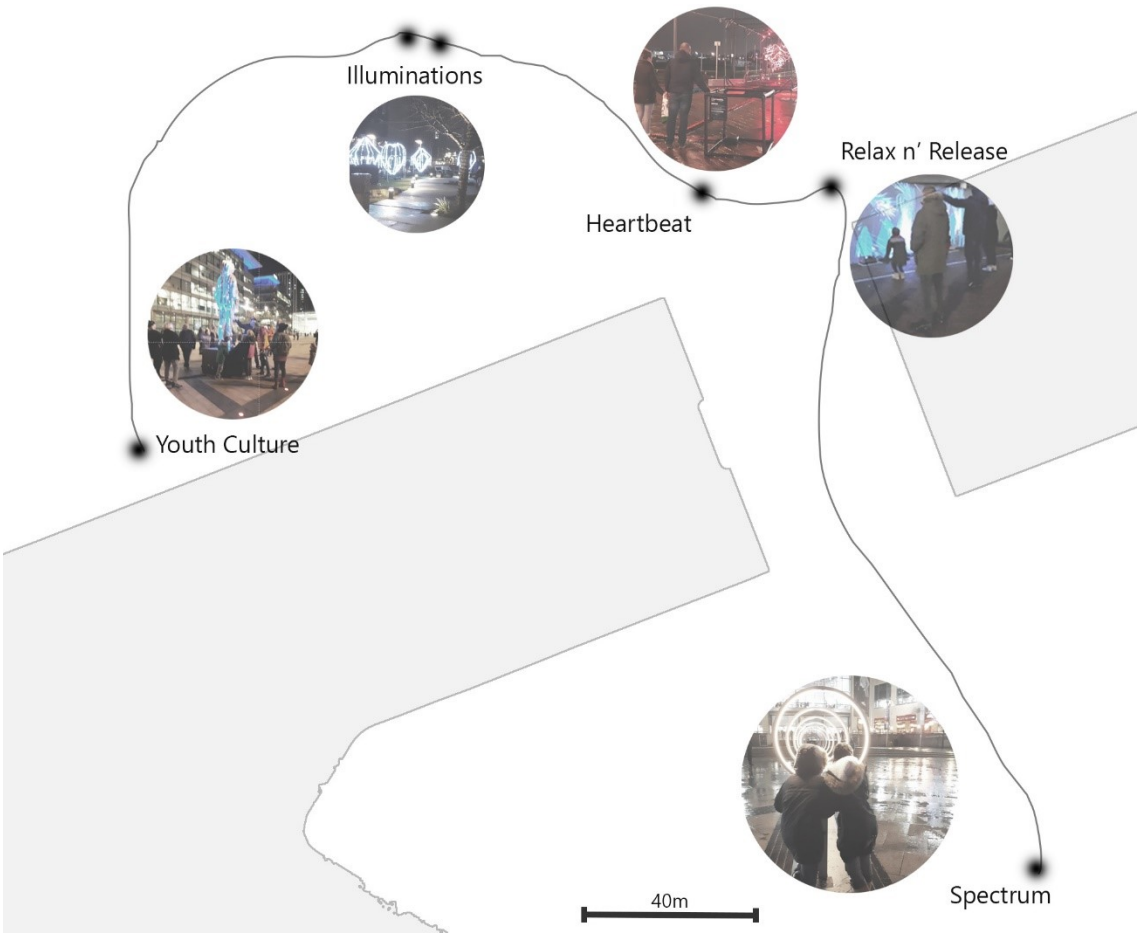


Fig. 7.5 Allocation of digital installations across the site area

b. More active Public space in Winter

In this context of space animation and local programming, an idea frequently mentioned in the interviews from the point of view of architects and designers as well as from stakeholders and even psychologists was that of enhancement of winter activity in public space through the application of media installations. Interestingly, all the interviewees agreed that digital interventions can play an active role in the city liveable all year round and address the common issue of public space's 'hibernation' during the cold months.

Architects, landscape architects as well as urban designers and planners are gradually becoming aware of the interplay between weather conditions and human behaviour (Liu et al., 2015). The urban designer professional pointed out that interactive installations can successfully revitalize urban space and motivate people to outdoor activity even in cold seasons.

"Digital interventions and media architecture can transform the winter city completely, especially in northern contexts. New experiences are created and the places are being re-introduced to the people. ***The public space is being redefined from an empty place (in most of the cases) to a place where we can feel, experience, entertain ourselves, socialise.*** *The urban place stops being a place that we pass by when going to our work, for shopping or for other entertainment; it now becomes the destination for all these activities, making people more interested in their own city."*

Michaela Kekeri, Urban Designer, Int.UD1

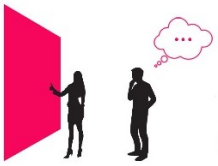
		Observing + Reflecting 	Chatting 	Playing 	Photo 
The Plaza		26%	19%	33%	22%
Waterfront Prome-nade	*Relax n' Release*	9%	27%	52%	12%
	The Heartbeat	13%	16%	39%	32%
The Enclosed Square		9%	19%	32%	40%
The Gardens		46%	15%	0%	39%
		20.6%	**19.2%**	**31.2%**	**29%**

Table 7.2 Forms of human activity around the installations

In a similar sense, event's curators and sponsors (Int. C1, Int.SP1) also note that the plurality of things happening, the changes occurring over the course of the day, the many different pursuits encourage people to stay more in public space and support the local retail business during their visit and, thus, the local economy.

"I think that the event **absolutely changes the winter experience in town! It brings light, colour and human interaction to it! Thus people are encouraged to bundle up, leave their houses and enjoy the winter fun!**"

Carol, 35, installations' supervisor I(nt.S5)

On-site discussions with people as well as field observations confirmed those objectives as people tended to try to overlook the isuue of cold weather in order to spend more time interacting with the artworks. The majority of people interviewed in weekdays (94%) mentioned that visiting the media artworks was the main incentive to stay out in public space on that day, although all of them recognized the cold weather as a challenge. It is worth mentioning here that the average temperature during the 10-day period of the event was 5°, with the real feel most of the days not exceeding 2°, especially after 5pm.

"Really impressive light art. There's so much to see that I'm persuaded to spend more time here despite the chilly weather!"

Sara,35, user

7.1.2 Visual Stimulation, (re)Connection With Physical Surrounding And Restoration of Human Scale

Based on the discussion in section 6.1, one of the primary issues of the MediaCity's UK and Salford Quays public realm was the lack of visual stimulation and human scale. This, in turn, has as a result users feeling less connected with their surroundings. The various references to public space such as 'cold', 'the same', 'dull', 'boring', 'unfriendly' imply a lack of satisfaction by the environment and a lack of sensory stimuli to engage with. The sensory and, particularly, the visual configuration of the urban environment greatly contributes to self-identity and place identity and, therefore, spaces that provide pleasant and memorable stimuli are not only enabling orientation and wayfinding but they also encourage the attainment of positive associations with them prolonging people's need to stay in them and establish contact with them (Ulrich, 1979; Parker, 1990; Laconte et al., 2016) and they are, ultimately, 'human friendly' .

The lack of substantial connection with the surrounding context is also implied by the high walking speeds reported at the area without the installations, as noted in section 6.1. A major aspect of the built environment that contributes to visual stimulation and human connection with it is *human scale*. A simple definition of creating a human scale

setting is ensuring that 'the objects that we interact with every day are of a size and shape that is reasonable for an average person to use' (PPS, 2016). Therefore, physical elements in public space that respond to the human features of the users are more likely to generate a positive perception of public space as people feel that they are considered in its design process. On the other hand, as it has been highlighted in section 2.2.2 the **standard, uniform and dramatically over-scaled buildings as well as massive civic plazas (like The Plaza) which started to emerge during the 20th century are, ultimately, associated with concepts of *placelessness*.**

"If you lose the human scale, the city becomes an ugly place"

Joan Clos, Executive director UN-Habitat, Habitat III conference

A key theme which emerged from the data was concerned with the observation that people started to be more aware of their surroundings (fig. 7.6, 7.7); their walking speeds slowed down, their walking patterns became more explorative and they started to engage more with the space. This was also reflected in the perspectives of the interviewed urban designer, artists and event's curators.

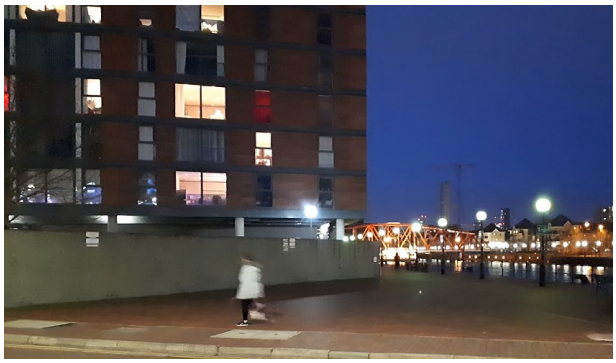


Fig. 7.6 (left) Inactive and over-scaled façade at the waterfront promenade
Fig. 7.7 (right) Restoring human scale and establishing connections with the surrounding though digital activation of the edge

As the urban designer pointed out by applying such digital tactical urbanist initiatives, cities can improve their public spaces so that they will be more human-centered and enjoyable.

*'A **new and more friendly image of the city is created**, attracting people to **pay attention to the place they live in**. The space is redefined and brings citizens closer to their own city which is now seen as a more appealing place.*

Michaela Kekeri, Urban Designer (Int.UD1)

Event's curators added, also, that they sought to create visual (and not only) landmarks at the area to draw attention among users and that was further encouraged by the use of light art as a type of form and expression during the dark hours of the day (Int.C1). Installations act as local landmarks through the creative use of light and human attention is attracted from a distance and consequently guided to the installation (see for example fig. 6.35). This, also, aligns with the idea of *digital props* as demonstrated in the section 3.1.3. Furthermore, it agrees with Cullen's (1971) theory of serial vision through the conceptualization of public artworks as *visual devices*. Similar to the perception of digital installation as visual and experiential landmarks, Cullen (1971) emphasizes on the dynamic and fluid quality of urban experience that is created by the way landmarks, views and other city features act collectively to attract people in space.

The field observations showed that by breaking down the scale of public space through the creation of multiple human-scaled interactive landmarks led to the creation of multiple smaller sub-spaces in the public realm were people gathered and performed various activities, according to the function of the installation, forming several micro-cores of activation distributed in the area (see fig. 6.29, 6.38, 6.46, 6.54). Furthermore, the size and scale of installation's area of influence was mainly related with installation's scale and location.

*"Art pieces can also help to create areas where members of the public can relax together, meet up with friends, and share experiences together. **I feel that these sorts of community spaces help to liven a city up and take it from feeling like a place to work and commute to a comfortable, interesting space**."*

Adam Powdrill, psychologist, Interview on 15/08/2019 (Int.PS3)

However, most of the digital artists interviewed for this research study agreed that for the digital installation to reach its full potential in terms of the contextual transformations, the

surrounding area also needs to meet some fundamental requirements. The three major physical aspects that affect installation's contextual effect were: a. the ambient light, b. the level of uniformity of the surrounding and c. the views leading to installation. Particularly, Ingo Kalecinski pointed out that the lower the ambient light and environmental colour and the more uniform the surrounding physical context (low visual stimulation) stronger the contextual impact of the installation will be as it will more easily stand out. However, he emphasized that the location of the intervention should be seen from various perspectives so as to draw more people (Int.D3). In a similar sense, the psychologist- play therapist interview for this study suggested that the surrounding context of the installations plays a critical role and that it should be a space were people feel calm and secure in order to feel relaxed to express themselves through their play with the installation.

'The installations should be built away from the noisy and busy city centre, to give a feeling that is a resort of relaxation and fun.'

Antigoni Grizi, psychologist-play therapist, Interview on 10/08/2019, Int.PS1

7.1.3 Public Space as a Stage for Experimentation, Expression and Performance

As it has been discussed in Section 3.2, in the last decades, novel forms of urban strategies and experimental initiatives have been adopted by cities in the process of placemaking and space animation in order to tackle issues such as lack of place identity, contextualization and human scale. These interventions are mainly light and temporary often characterized by a high level of creativity. It is firmly believed that the short-term character of these transformative methods leads to higher levels of spontaneous behaviour by the users, while also providing designers and planners the opportunity to experiment with different profiles of space's character before taking any final and permanent decisions (Weiss 2008; Lydon and Garcia 2015).

In this context, **the diverse conceptualizations of public space and the perception of it as a stage for experimentation and free expression emerged as a theme from the interviews with all the digital artists.** Conceptually, this idea aligns with the phenomenological approach of place as space for *personal Expression, pathetecture and temporal dynamic experience* discussed in section 2.1.3. Particularly, Stanza (Int.D1) argued that he sees public realm as a 'multidimensional' space to convey messages

through his artworks and therefore as a space for experimentation. Being an artist highly concerned about how technology can be used to '*liberate public spaces'*, he emphasized that for him public realm is, ultimately, a '*frame to address concerns and raise community awareness on social issues through art'*. On the other hand, Maria Almena from Kimatica Studio stated that through their installation they aimed to create a new micro-happening in the urban context and infuse it with vibrancy. The manifestation of this happening essentially would be people's informal movement, gestures and spontaneous dancing performances.

> *'I believe our installation invites people to stop and play. Most of the public space are to pass by or just to chill on a bench but our installation offers a space to be active and playful as well as encouraging exchanges and connections with others.'*

Maria Almena, Kimatica Studio (Int.D2)

In a similar sense, Gonzalo Soldi (Hub Studio) noted that their team imagined the urban square as a place that would provide for the fundamental human needs for self-expression, connection and play. With an underlying theatrical approach that characterized all of their projects, they regarded the Lowry Square as a theatrical stage and a setting to pass their message about human communication. The tool to achieve that was their artwork, Spectrum, which wished to encourage people be more expressive, 'less shy and loosen up'. Furthermore, Ingo Kalecinski (GNI Project) highlighted that in order for the installation to become the heart of public space, it should be located at a 'vantage' point where a lot of people can see it and spontaneously decide to play with it. In this way the entire surrounding setting gains importance and becomes a creative focal point in the context of a wider public realm.

> *"We calibrated the sound and created echoes of the human voice in order to "fill" the public space and create a whole new soundscape that would change people's perceptions about it"*

Gonzalo Soldi, HUB Studio (Int.D4)

This perception of space was, finally, conveyed to the users as well and that can be identified in the several descriptions that people used to express their thoughts on this form of new urban experience with the digital interventions. Words such

as 'perform', 'mimic', 'exaggerate', 'test', 'funny' and 'amuzing' are all indications of an different understanding of public space as a setting that provides (even momentarily) the opportunity to them create and live their own moment of performance. These descriptions were more often when related to the installations of Spectrum and Relax and Release (regarding the enclosed square and the part of waterfront promenade respectively), which are installations that engage more than one senses. In contrast, referring to the Garden's illuminations although the words such as 'atmospheric' and 'magical' were rather frequently mentioned, users did not primarily use descriptive expressions that could be considered as a different and creative (re)interpretation of their surrounding environment.

Fig. 7.8 Theatrical gestures during interaction with Youth Culture

The idea of different appreciation of space was also reinforced through human behaviour observations both from the author as well as from members' of the staff interviewed (refer to sections 6.2.4, 6.3.4, 6.4.4) which all agreed that people's reactions and performances tended to be rather extroverted, playful and even theatrical a lot of times; Users were often observed to mimic each others' gestures, dance freely, show off eccentric moves and, generally, adopt a form of ludic and 'showy' behaviour which is definitely not witnessed in the typical everyday experience of public space. Role playing was also observed as a behaviour between users around the installation. For example some of them, especially those in large friend groups, would sometimes adopt leadership roles and request other people to perform certain kind of activity or form of interaction or even inventing an improvised game to take place around the installation (fig.7.8).

In this context, play therapist provided a deeper perspective regarding people's theatrical behaviour by pointing out that such installations promote imaginative thinking through

engaging the user holistically (sensory, bodily, cognitively, emotionally) and not only through the mere observation of a spectacle. This in turn momentarily transforms their perception of the surrounding environment; in this case, public space becomes a stage of creative expression. This, also, potentially explains the fact that people tended to perform more theatrical gestures and used more expressive descriptions when referring to the multi-engaging environments of Relax n' Release and Spectrum.

'People find it so much fun because they can connect themselves actively with the installations and can also include their imaginative thinking. They ***become members of the experience and they are not just passive observers'***

Antigoni Grizi, psychologist-play therapist (Int.PS1)

7.1.4 Installation Characteristics

The field studies as well as the interviews with members of staff, event curators, psychologists and participants provided some interesting key factors regarding the nature and design of the installations themselves as potential 'public space activators', as well as aspects related to their successful integration into the surrounding context and views concerning the effectivity of overall network of digital experiences as a comprehensive urban intervention.

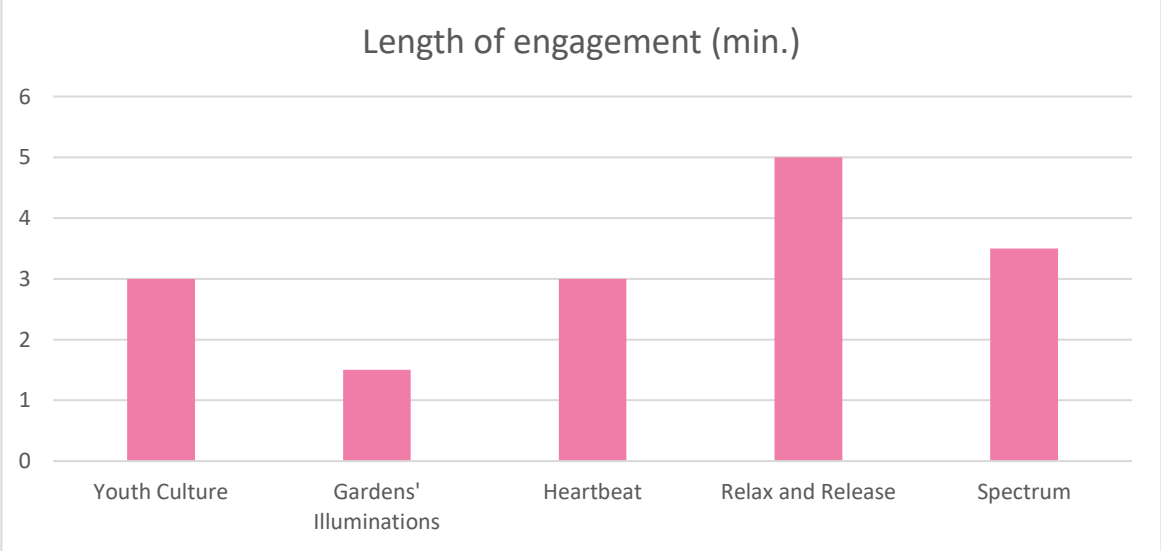


Fig. 7.9 Duration of engagement with media installations

As seen in figure 7.9 (and discussed in the previous chapter) users' duration of engagement with the digital interventions varied. This can be considered as an indicator of the quality of their experience and interaction. Fundamentally, the key themes associated with the quality of human engagement that emerged from the aforementioned data sources were two; a. the kinesthetic dimension and b. the cognitive/ conceptual dimension. The overarching idea regarding those themes is that *the more levels of engagement an installation affords the more successful as an intervention is*, or, in other words, as J. Taylor from the curators team pointed out 'The more interactive the better'.

The kinesthetic dimension refers to an installation's quality to stimulate human senses and achieve the physical bodily engagement of the user. It involves the fact that some installations although being designed as pieces of public art, in order to get the complete experience of them people need to form particular corporeal engagement with them.

In that sense, it was found that multisensory installations like Spectrum (which triggered both visual and acoustic experiences) and installations which require both sensory and corporeal incorporation like Relax n' Release (where visual effects were triggered through body movement) manage to attract more users and make them stay longer. On the other hand, the conceptual dimension also seemed to play a quite critical role especially in some particular user groups. This refers to the ability of the installation to be arbitrary in nature and open to various interpretations. That means that there is not one completely pre-determined direction of how it should be used. An example of that approach, in the context of the case study, was the interactive sculpture Youth Culture which enabled multiple forms of engagement not only through its actually interactive features (cctv- micro camera system) but due to its overall ambiguous nature which encouraged various interpretations and associations; for example, exploration of its physical form, observation of its dynamic appearance with the flowing LED streams, examination on the complex technology of the electronic structure and reflection on the overall message of it as an artwork. Similarly, Relax n' Release also seemed to have a strong conceptual dimension besides providing a rich kinesthetic experience, as its multiple distinct visual effects appear gradually based on the type of user's movement. Therefore, users were encouraged to experiment and test different moves in order to 'unlock' all the hidden effects. This potentially provides an explanation why this installation achieved the higher level of engagement both in terms of duration but also in

terms of number of users, in contrast to the Gardens Illuminatons which by their very nature did not demand any interaction.

On the other hand, the Heartbeat installation, despite being multisensory (engaging vision and touch) and having large-scale interactive features and a prominent location which enabled the attraction of large audiences, it did not manage to achieve particularly long-lasting engagement. That is because its function is rather simple and unambiguous and, thus, any further creative interpretations are restricted. Therefore, although it initially produces a sense of surprise, it provides limited playful experience. Furthermore, its physical form which mainly involves wires does not allow any different form of bodily engagement and spatial exploration. As Caillois (1967) pointed out, there should be some potential for manoeuvre and exploration so as for a ludic element to be enjoyable. In other words, the need for improvisation and creation which are fundamental in situations related to play, in the case of Heartbeat are not addressed. The very need of exploration related to creative installations, also, aligns with the main features of urban art. Particularly, according to Noë (2000) urban art installations should be designed to lack clarity, to a certain extent, so that the observer will not make sense of everything about them in one glance and to be interpreted they should be processed.

In terms of the network of the digital interventions as an entire urban initiative and new experience, the psychologist- play therapist emphasized on the importance of diversity in scale, materials and colours.

> *"I think that different sizes of interactive installations need to be created for children and adults. In addition to this, if we refer to fully bodily engagement, smooth and soft textures incorporated into the surfaces of some installations would be really helpful for all the participants, since they give a nurturing and loving sensation to the user, and make them feel comfortable while engaging in the interactive play. Last but not least, I think selection of colours should be adjusted to the special needs of the group that the installation is made for. For example, when we have an elderly group, intense colours might be repulsive for them, and less strong ones might be more suitable for them."*

Antigoni Grizi, Psychologist- Play therapist (Int.PS1)

In terms of the main challenges related to this urban initiative, all designers as well as interviewees related to the planning and execution of the digital event (Int. D1, D2,D3, D4, C1, SP1) agreed on three fundamental ones; a. the funding and restricted budget, b. weather conditions and c. the need for additional installation robustness due to its outdoor application. Interestingly, J. Taylor from Quays Culture (Int.C1) team noted:

> *"The artworks must be incredibly robust to withstand the wet, freezing and windy conditions. Even the smartest technologies can be pushed to their limits in these conditions, so technically it's incredibly challenging work to create and maintain"*

Strict funding and tight budget was also mentioned as a key-challenge of this urban strategy, which is also interrelated with the issue of robustness as well. That is based on the fact that robust systems, require sophisticated digital technology which in turn has high cost. Keeping a balance between installations' quality, performance and robustness and stay within budget was a challenging part for both designers and events' planners. Finally, the tough weather conditions posed a further threat to the entire initiative both because it made it more challenging for people to stay long and interact with the installations but also because it created an even greater need for installations robustness so that they could address strong winds, rain and high levels of humidity (Int. D1, D2,D3, D4, C1).

7.2 Social Activity

Public space is the urban setting where people from different ages, culture, gender and background meet and congregate providing the terrain for social interaction. Essentially, it is a space open to everyone, where planned and spontaneous events take place and people mix and mingle. However, as discussed in section 2.2, in the last decades public spaces often miss their fundamental quality as social spaces. This section will look deeper at how urban digital interventions impact on this dimension of public space and their potential on creating more responsive and socially sustainable public spaces. How do different forms of media installations encourage a variety of interactions and promote more mixed and diverse public realm?

7.2.1 Social Inclusion, Diversity and Community Identity

A significant insight from this study which emerged as a theme from the field observations as well as the interviews with event's curators, staff, sponsors and designers was, fundamentally, the role of the digital urban interventions in the promotion of social inclusion and diversity in public space. As discussed previously (refer to section 7.1) field studies showed a much higher mix in urban dynamics during the presence of the installations comparing to the area's demographics before. Indicatively, table 7.1 illustrates a rather uniform distribution between age groups when the site was digitally enhanced. Yet, this level of diversity was not only based on age but also on culture, background, gender and physical ability (fig. 7.10, 7.11).

Fig. 7.10, 7.11 User group diversity at the digitally enhanced area

According to PPS (2019) light, experimental and creative interventions combined with programming which is responsive to community needs is the best way to way to address issues of social exclusion in public space. This resonates with event curators' approach who during the interview emphasized the vital role of this tactical strategy in fostering the sense of social integration of the area. Particularly, event's curators highlighted that social inclusion was a key concept for the design and execution of this urban initiative.

> *"The event always attracts a broad demographic, bringing people from all ages and backgrounds together to experience something special. […] By making the activity free, unticketed and outdoors we aim to remove barriers that can prevent people accessing high quality art, reaching and engaging a diverse audience that is most reflective of our society"*

Jennifer Taylor, Quays Culture (Int.C1)

According to event curators and sponsors, through this event they wished to promote a state of social sustainability in MediaCity's public realm promoting the fundamental values of equity and democracy through thoughtful programming, design and allocation of the installations. Their goal was a well-balanced mix of people who would also feel as active citizens through their lively engagement with the new 'parts' of the city. The contribution of the urban media interventions would, consequently, make public spaces lively urban micro-societies which would blend them more into the communal context of the wider city and therefore promote the establishment of local identity (Int. C1; Int.SP1).

In the same context, the urban designer professional noted that providing the local residents and visitors with an outdoor public setting they can enjoy and want to be can increase the sense of community. Since contemporary public space design often ignores factors that can essentially make it an active and inclusive environment, she pointed out that this form of urban interventions may offer a significant foundation for a public space which looks, feels and acts as public by giving the opportunity to a new creative experience available to everyone (Int.UD1).

> *"The city is being re-introduced to younger people who are interested in technology but not in the 'history of the city'. At the same time, older people who are interested in the 'history of the city' are being introduced to a new city but to the technology as well. Digital enhancement of public*

> *spaces brings people from different backgrounds together offering the same experience to everyone."*

Michaela Kekeri, Urban Designer (Int. UD1)

A crucial aspect regarding the concept of social inclusion related to the idea of the digital urban strategy, which arose as a theme from the interviews is the free and easily accessible opportunity to art and, essentially, the notion of public art (Int. D1; D2; D3; D4; C1; UD1; SP1).

> *"The most important part of it is that the opportunity to experience art now becomes available to everyone and not only to those people who can afford to pay for the entrance at a museum/gallery/theatre. Initiatives/events like these help in addressing the urban challenges of our time/community.* ***Social inclusion can be achieved and the inequalities of our society minimised. The communities therefore become mixed and stronger. An empty space can be transformed to a place where everybody interacts no matter their colour, education etc****."*

Michaela Kekeri, Urban Designer (Int. UD1)

In the perspective of all aforementioned interviewees, the significance of public art and cultural activity was emphasized in relation to community integration. A powerful and lively public art strategy is considered for them as critical in providing the chance to the citizens to come together, go through a shared experience and establish a sense of collective identity and place attachment (Int. D1; D2; D3; D4; C1; UD1). This aligns with PPS view (2019) that a way to foster a public space's level of inclusion is to stress the role of art and culture in it and recognize it as a 'storyteller'. Particularly, for PPS public space's configuration always conveys a certain narrative. Therefore, choices related to space's aesthetics, like public art, send a collective message to the community that may be interpreted in different ways by each individual or user group.

Within all interviews with installation designers, the feature that was noted as the most vital in this form of outdoor digital art exhibitions is the fact that they give the opportunity to people who are not familiar with art, and especially this form of art, to get in touch with it (Int. D1; D2; D3; D4). In that sense, Stanza (Int.D1) noted that to achieve this he

created a multifold concept for his installation, Youth Culture, offering various interpretations depending on each user group, wishing to avoid designing for a particular target audience. Regarding the installation the Heartbeat, Ingo Kalecinski (Int.D3) referring to the use of the universal symbol of the heart pointed out that:

> *"The cross-social/ cultural aspect might not always be as obvious but it does form a key aspect of our works, to bring people from all backgrounds together."*

Ultimately, the key idea between all designers was that these art installations are projects publicly available to everyone which being also located to busy points of the city, people can come across intentionally and unintentionally. Thus, art is completely integrated into the urban tissue and built environment. According to Twaites et al. (2013: 35) an overall sense of coherence and continuity in an urban setting combined with a 'fine grain of localized variation' that can be induced though aesthetic details, public art and urban equipment can foster the sense of space's social sustainability.

Providing a public space configuration for differing physical abilities, mental levels and generally demographics, also constitutes a way to establish social inclusion according to PPS (2019). In this context the psychologist and play therapist professional pointed out that interaction with urban media installations can benefit all age and mental health needs' groups. Even for people who would not be able to fully engage physically with all features of an interactive installation, the observation of others doing it can bring up joy and liveliness within them (Int. PS1). Especially for people with special mental need she stated:

> *"I think for people with dementia can bring to the fore memories that have forgotten for years, since the cognitive brain and memory is reactivated when you get to move creatively and play with an installation that stimulates the brain in a quite different way than everyday activities do. For people with mental health needs such as autism or mental health disorders, installations can be found to be extremely valuable, as they open up new perspectives for them, they allow them to be who they are and express their own way of thinking and carrying out creative tasks without being criticised by the general public, since the installation is about exploring, playing and learning. Autistic people especially love digital material, music, sounds and*

textures, so I think that installations with multi-sensory equipment would be ideal for them."

Antigoni Grizi, Psychologist- Play therapist (Int.PS1)

But how valuable was actually that initiative for the people? Did they realized the benefits provided through that cultural strategy? On-site discussions with people revealed that participation and engagement with the urban art initiative was rather meaningful for them and they very often noted the role of public art in making their environment attractive to more people, celebrating diversity and essentially 'make people feel happier'.

'Such actions are absolutely vital. There is a common true that art is for everybody and cultural activities make communities and people who they are. There are people coming to MediaCity only every December to enjoy this digital happening so this turns out to be an effort towards the creation of a local identity that didn't exist before'

Gill, 55, user

Fig. 7.12 Digital installation implying the social aspect of (public) art

In general, the during the quick discussions people mainly commented that these events and outdoor exhibitions help to promote a strong sense of equality, community and cultural identity.

7.2.2 Playful Engagement and Social Connection

"The human being has the need to accumulate energies and to spend them, even waste them in play…play, sexuality, physical activities such as sport, creative activity, art and knowledge are particular expressions and moments, which can more or less overcome the fragmentary division of tasks"

Lefebvre, 1996:147

The social dimension of digital urban interventions which, essentially, by being interfaces for collective engagement manage to act as means for triangulation and the creation of new ephemeral encounters (digital encounters) in the city has been greatly discussed in section 3.2.2. What has not yet been discussed is the role of play and playful behavior associated with such installations in the enhancement of social connectedness creation of encounters with strangers. The concept of play and urban playfulness has been introduced in section 3.2.3 as an experimental and self-expressive way to interpret the surrounding environment through the interaction with media installations, what has not been assessed is the contribution of these playful digital installations as tools that can improve people's social skills in public space.

According to Huizinga (1955) in his seminal book Homo Ludens play is "a free activity standing quite consciously outside 'ordinary' life as being 'not serious,' but at the same time absorbing the player intensely and utterly. It is an activity connected with no material interest, and no profit can be gained by it. It proceeds within its own proper boundaries of time and space according to fixed rules and in an orderly manner." (p.13). Ultimately, play may refer to any form of aimless activity performed just in the sake of performing it. In that sense playful bahaviour characterizes the practices of making art, making love, meditating, praying or even just contemplating (Schaefer, 2003).

A fundamental behavioral pattern that emerged from field observations was this form of playfulness that characterized all various user groups. Particularly, once users got into the direct interaction/ play zone of the installations, they begun to play with it, move around it, compared their performance and reactions to others, lied on the ground, danced or squeezed themselves between parts of the installations. This type of creative playful behaviour which was often based on acrobatics and funny expressions initiated positive competition, conversations and lots of laughter. It should be noted here that this

form of behaviour was mainly observed in the interactive installations (Youth Culture, the Heartbeat, Relax n' Release and Spectrum) rather than in the digital non-interactive installations of the Gardens. Self-reported data from field experiment, also, support this theme as people tended to mark areas which accommodated more interactive and playful installations as spaces of easier socialization, with the Gardens which was the only area with non-interactive installation being marked with a negative figure.

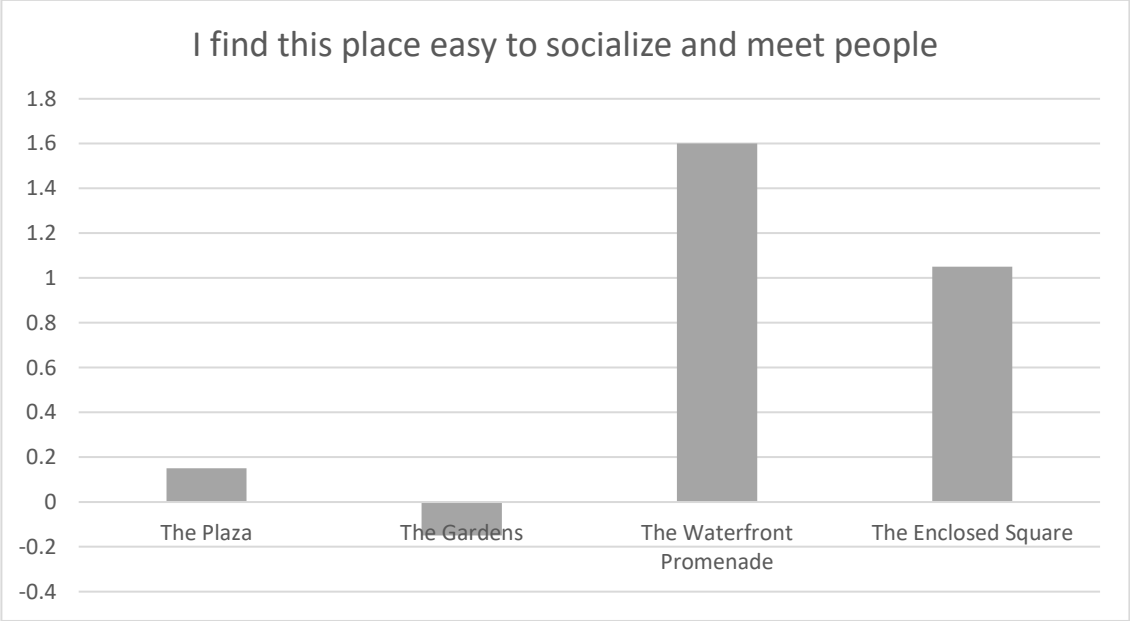


Fig. 7.13 Opportunity for socialization and informal discussion in the four digitally augmented public spaces according to users

In a similar sense, interviews with the designers showed that a common intent between all of them was the creation of an artwork that people would talk about while playing with it and, hopefully, get finally to connect to each other and with their environment (Int. D1; D2; D3; D3)

> *"People always share something silly they do, either with people they know or with complete strangers! By moving all together they tend to feel closer to each other both physically and psychologically"*

Maria Almena, Kimatica Studio (Int.D2)

Sharing laughter and fun encourages feelings of empathy, compassion, trust, and intimacy between individuals and, therefore, play is associated with a general mindset rather than a particular activity (Schaefer, 2003; Kaduson & Schaefer, 2006; Meany-Walen & Teeling, 2016). As a result, a playful behaviour helps people to loosen up,

'breaks the ice' between strangers and promotes the creations of new relationships (Schaefer, 2003). It has been also characterized as 'social play' as it has proved to enhance social co-operation and feelings od self-acceptance and altruism (Cheah et al., 2001).

In that context, Carol, as a member of event's staff and installations' supervisor pointed out:

> *"People that would initially went out just to walk their dog they or buy some milk, noticed the situation, took part to it and* ***ended up making new friends or just playing and laughing****. Something prompted by the involvement with the interactive installations"*

Carol Lamb, installations' supervisor (Int.S5)

Interestingly, a need that most of the designers emphasized on was that of traditional/ analog communication. Particularly, G. Soldi, M. Almena as well as I. Kalecinski noted that they sought to use digital technology as a tool to promote physical interaction and communication between people rather than using as a medium itself for the production of networked interaction and encounters (Int. D2; D3; D4).

> *"****We wanted people to go back to basics and physically interact with one another to make something happen together****.[...] although we use technology for the installation we aimed to create something as human and organic as possible in order to emphasize the essential parameter of physical human interaction into communication"*

Ingo Kalecinski, GNI projects (Int.D3)

Especially G. Soldi noted that Spectrum as an artwork sheds light on the phenomenon of interpersonal communication through playful and spontaneous forms of interaction disconnected from language which is considered as the basic feature of speech (Int. D4). Generally, in interviews D2, D3 and D4 the artists seemed eager to encourage the creation of playful social contexts were conversations and interactions would occur among people who would not necessarily interact in the normal plan of their life. For them, technology in the form of urban art can facilitate human communication and brings new tangible encounters out in public space changing the everyday social experience in the city (Int. D2; D3; D4). They stressed that they aimed they wished to provide an artwork

that would both create a pleasant experience but, also, offer opportunity to people to run into each other, cooperate and achieve something together (ibid). In this sense the psychologist and play therapist professional adds:

> *"Urban interactive installations help people to express themselves and to become more sociable too. In many of those digital pieces people meet with each other to play and explore the lights and the effects together. This in itself is a motivation to meet others, even strangers, and to go through a creative and playful experience together. It is scientifically proven that play brings people together anyway, especially those from different cultures.* ***Through these interactive installations people use their mind processes to communicate non verbally with each other, and thus, they communicate on a deeper-unconscious level. Their bodies and minds can easily come to a harmony, since they cooperate while being in contact with the installations. People, without realising it, express themselves by achieving effort to interact physically, cognitively and mentally with the installation so as to make it bring up an effect that they are curious to see it happening****."*

Antigoni Grizi, pshychologist- play therapist (Int. PS1)

The idea that people become more sociable during their playful engagement with the digital interventions, also, aligns with evidence from on-site discussions with people as 42% of them mentioned that they spoke to a stranger during their visit. Interestingly, it was also observed that people were considerably more approachable and friendly in field-discussions that took place during the presence of the digital event rather than without it. Indicatively, the rate of responsiveness when installations were there was 90% (the majority of people agreed to get involved in the conversation and answer study's questions), while when they were not the rate ranged between 40-50% meaning that a great amount of them was not willing to get involved into any form of conversation with the author. This observation implies that a higher level of sociability and openness to strangers characterized people while experiencing the digital event.

*"This in itself is a motivation to meet others, even strangers, and to **go through a creative and playful experience together**.[…] . It is scientifically proven that play brings people together anyway, especially those from different cultures."*

Antigoni Grizi, pshychologist- play therapist (Int. PS1)

Playful behaviour can be also associated with what Twaites et al. (2013) call sense of 'our-ness' which forms a certain level of territorial scale that encloses individuals and connects them to function at 'any physical or social scale' (p.64). They note that this sense of 'our-ness' can be induced through the design of various urban forms; playful engagement with media installations may be considered one of those forms. Fundamentally, according to the authors, when people experience 'ours' they subconsciously feel a 'sense of belonging to something or somewhere , to which others may also feel the same' (ibid). This idea reflects on the observation that people across the spaces of interaction very often used to share common behaviour and coordinated their reactions like a team although they did not know, like for example infectious laugh or clapping which were rather frequent group reactions.

7.2.3 Proxemics and Reduction of Social Distance

As mentioned in the previous section, a theme that emerged as an intention among the majority of media artists was the promotion of people's physical connection and 'analog' interaction rather than the creation of a virtual transaction often accompanied by the use of technology in regards with human communication. Generally, aspects of human social behaviour such as facial expressions, spatial proximity and physical posture are considered as 'social cues' that can highly influence the level and quality of human interaction and constitute indicators of people's sense of attention, empathy, politeness and other social feelings (Rios-Martinez et al., 2015). Particularly, the way individuals manage their space (personal space and territoriality) and proximity to others may provide strong evidence related to their preferences and experience in a certain spatial socio-context (Mahmoud et al., 2013).

What was initially observed during the field observations was, what is also known as, the Honeypot effect (Brignull and Rogers, 2003), which refers to the gradual congregation of users in the the periphery of the installation without necessarily interacting with it simply to check what is happening and how the installation functions. Interestingly, it was

observed that in all studied installations people would approach and progressively increase as other people passing noticed them and decided to join them in the interaction zone. This was clearly pointed out as GNI's projects' intention when designing their artwork the Heartbeat (Int.D2):

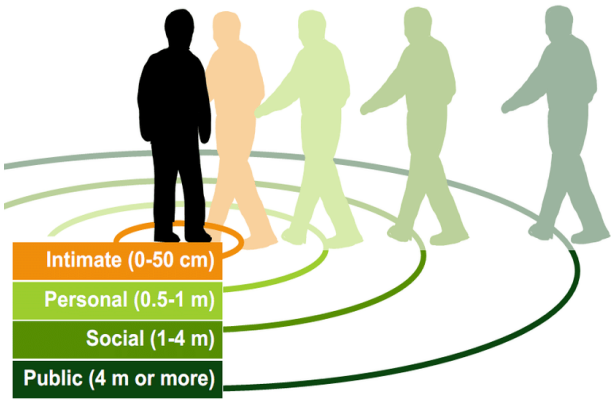
> *"We wanted to bring people in public space together and closer, not only psychologically but physically as well, than they would normally do."*

Ingo Kalecinski, GNI projects (Int.D3)

This element of social connectedness and decrease of physical proximity can have positive effects on people's general state of wellbeing as well. Collin Ellard, neuroscientist and researcher working in the intersection of psychology and urban design commented during the personal interview (Int. NS.1):

> *"I think that anything that brings people closer together to interact, observe, and mingle will help improve well-being"*

Various theories on psychological comfort discuss the relationship between social distance, visual behaviours and sense of comfort (Aiello, 1977; Greenberg et al., 1980). Generally, the relationship between intrusion and feeling of discomfort is proportional suggesting that an increase in intrusion consequently causes increase in discomfort (Hayduk, 1981). But what is considered as intrusion and how can physical proximity between people in public space be classified?



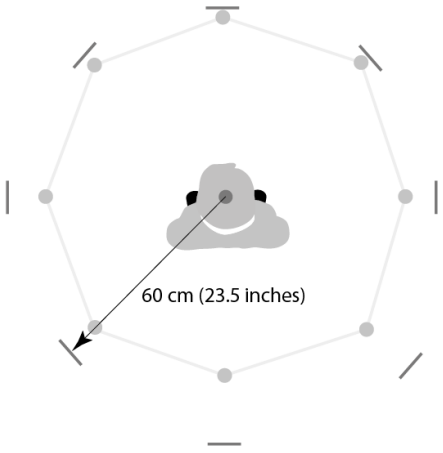


Fig.7.14 (left) Hall's proxemic zones (Marquardt and Greenberg, 2012)
Fig.7.15 (Right) The average dimensions of personal space for North American university students approached from different directions (adapted from Gifford, 2007)

According to the seminal work of Hall (1966), space around an individual can be classified in regard to social interaction into four different zones (fig. 7.14). The respective distance from human body is as follows:

- the public zone > 3.6m
- the social zone > 1.2m
- the personal zone > 0.50 m (> 0.60 m in UK)
- the intimate zone <= 0.45m (<= 0.60 m in UK)

Ultimately, these dimensions are not strict and vary according to age, culture and context. As cultural variations highly affect aspects of physical proximity, it is noteworthy that the metric of personal space in the UK context is > 0.60 m. (as shown in Fig. 7.15) and not 0.45 (Sorokowska et al., 2017). Furthermore, it should be noted that physical proximity among people did not have to decrease due to high density of the area and general overcrowding. The total population of MediaCity's public realm was totally reasonable and 'public distances' among people could be very easily achieved. However, people chose to visit some certain locations although their proximity metrics had to decrease as shown below:

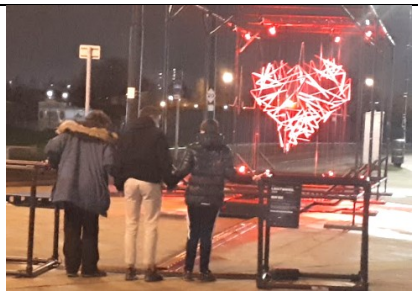
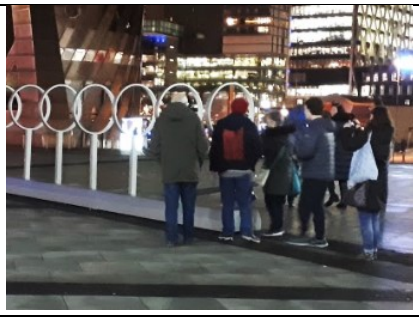
Installation		Average values (cm) of individuals' distance **within play area**
Youth Culture (@the Plaza)		<50 cm.
The Heartbeat (@the waterfront promenade)		<30 cm.
Relax n' Release (@the waterfront promenade)		<40 cm.
Illuminations (@the Gardens)		<1 m.
Spectrum (@the Enclosed Square)		<30 cm.

Table 7.3 Human proxemics within the installations' play areas; both average social and personal distances have been reduced

"Such interventions almost 'force' people to interact with each other by allowing them to be in close proximity to each other and giving them a shared experience to talk about."

Adam Powdrill, psychologist (Int.PS3)

As can be seen in table 7.3 individuals' distance within the play area of all installations, besides the Gardnen's illuminations, is remarkably lower than the average distance of social and public space (1.2m and 3.6 m respectively). The metrics, actually, represent personal and even intimate space distances which, ultimately, means that people willingly let strangers enter their personal space without feeling uncomfortable. When people unintentionally share their personal space (crowding, sharing a lift) tend to feel uncomfortable and, thus, avoid eye contact and facial expressions (Argyle, 1965) something that was not observed in any of case study areas. Entering another person's personal or intimate space is considered as an indicator of perception of their relationship as it is usually an indication of familiarity (Rios-Martinez et al., 2015). Intimate zone mainly involves interactions with people closely related to us like family, close friends and partners, while personal space applies for conversations with colleagues, friends and group discussions. The zone of social distance (1-4m) refers which refers to strangers and recently formed groups is the one that was expected to be identified among strangers engaging with the interactive installations.

Variations in people's physical proximity in each installation (table 7.3) can be explained through the varying nature, function as well physicality of each piece. For example, Youth Culture sculpture stands on a podium and it is 'wrapped around' with interactive features so to explore it people, inevitably, had to get very close (fig. 7.17). Relax n' Release, technically, requires larger personal space so that people can perform their dance moves seamlessly; Yet, the installation turned out to form an area with high human density and people were willing to share their personal space with others by performing often groups 'choreographies'.

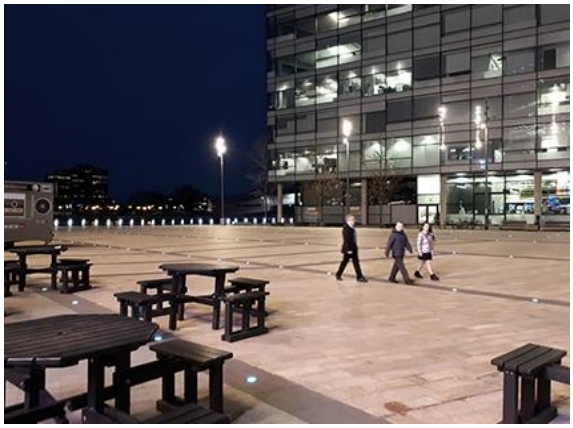



Fig.7.16, 7.17 The Plaza on a Thursday evening before (left) and after (right) its digital augmentation

7.3 Perceptual Experience

In the context of this study urban space is understood as a setting that shapes human response through stimuli and information that subsequently generate emotions and feelings. As discussed in previous chapters, urban media interventions are also seen from that experiential perspective which also aligns with Dewey's (1934) idea about art as experience. For him, the actual purpose of art is reflected on the perceptual experience that it creates, something that cannot be achieved purely by looking at the artwork. So, ultimately, which are the qualities of perceptual experience identified through people's engagement with the media installations in the investigated public spaces?

7.3.1 Affective Experiences

This section seeks to explore the sensitive, emotional, affective experience of public space through the interaction with digital installations. Particularly, this part of the study will analyze and synthesize data from field studies as well as interviews and digital ethnography in order to identify the effects of these urban interventions on users' psychological state and emotional response to their surrounding context. What are the links between public space configuration, media installations and human emotion and mood? A multidisciplinary approach is carried out to achieve an advanced understanding of the connection between the digital enhancement of public space and human emotions and affect, the combination of which forms a great part of human perceptual experience of an environment. An affect is a term that incorporates a wide range of feelings that individuals can experience (Batson et al., 1992). It integrates both emotions and moods. An emotion is an intense feeling that is temporary and is usually targeted at a source (ibid).

a. Walking patterns and affective contact

According to Jones (2005), by choosing their everyday routes people form their own affective settings and affect the city, while the city also affects them. People's walking patterns and their respective variations with and without the presence of the digital interventions serves as an initial indicator of human affective response to the two versions of the studied public realm. As discussed in chapters 5 and 6 the overall user's perception of the environment can be reflected on the level of engagement they develop with it which shows a type of affective contact manifested in their movement. As shown in figure 7.18 the overall amount of purposive walking dropped significantly in all public spaces, besides the Gardens, and a lot more people performed engaging walking during the presence of the installations. Furthermore, the average walking pace in the area dropped from 5.12 km/h to 4.12 km/h showing that people had greater interaction with the environment. In terms of their affective reaction, according to Mehrabian-Russell theory (1974) this behavioral change suggests a form of evidence in three dimensions: the level of pleasure this environment affords, the level of arousal and the level of control (activating–not activating).

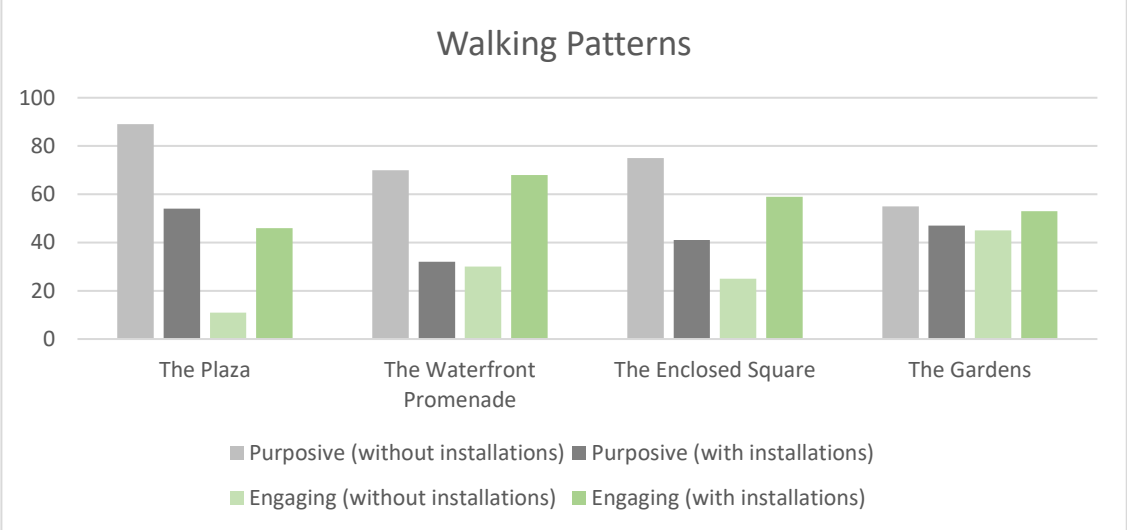


Fig.7.18 Comparative bar graph showing the levels of purposive and engaging walking at the studied public spaces with and without the presence of media installations

Physical comfort in terms of weather conditions, also, affect pedestrians' walking behaviour in public space (Clark et al., 2013). However the 'before- after' study for this research was carried out in similar weather conditions, with 'before' phase being slightly privileged with 2° higher mean temperature (5° higher in real feel) and almost no precipitation; conditions that in other case would suggest a weaker pedestrian

engagement with public space (faster walking paces, fewer stops shorter duration of stay, increased purposive walking) in the second ('after') phase of field studies. Yet, as the observations showed, this did not happen. Adam Powdrill, one of the professional psychologists interviewed for this research study provided a relevant input that aligns with the findings of field observations (Int.PS3):

> *"Larger cities and public spaces can also seem very busy and fast-paced. Take London for example; everyone is rushing around, piling in and out of tube stations, always on the move.* ***Creative installations such as those above could help people to slow down and reflect on their experiences and thoughts, instead of mindlessly racing from A to B and rushing through their day****."*

Brittany, a MediaCity resident and participant of the field experiment who was later interviewed on her overall place experience with the digitally enhanced public realm noted:

> *"I think it's a very positive outdoor activity that gives to people opportunities* ***of having fun, be amused and enjoying a walk more****."*

Brittany, 28, Int.P2

While Kate, 32 (Int.P3), another experiment participant and interviewee who visited the area for the urban event mentioned:

> *"The light festival gave me "cozy feeling".* ***I normally don't walk around outside when it is cold, but it was a good chance to go out and walk*** *across the lights and decorations."*

b. Emotional Response

As discussed before, emotions are strong and temporary feelings which are frequently manifested in facial expressions and body language (Izard, 2009). A fundamental study's hypothesis was that media installations would form a significant environmental stimuli for emotional reactions and engagement with them would enrich those reactions further. This hypothesis was, also, supported through the interview with the professional psychologist:

*"It makes people happy and offers a positive feeling. It also sometimes makes the area look nicer and people always appreciate that. It can provide a **feeling of being valued** by having something like that in their area."*

Valia Papadopoulou, Psychologist,(Int.PS2)

Looking deeply into the emotional experience of people during their interactions with the media installations was a fundamental goal of this study and therefore various methods and techniques were deployed in order to finally assess data from multiple sources. When asked about people's emotional reactions with the artworks overall, the installations' supervisor noted:

*"People initially seem a bit **hesitant but gradually they loosen up** and engage more and more with the installations, they enjoy them more and generally they seem to get more deeply into to that interactive dynamic experience."*

Carol, 35, installations' supervisor (Int.S5)

The positive feelings of pleasure and energy were the most common observed emotional reactions by all staff members interviewed. 'Happy' (Int.S2, S3, S4,S5) , 'excited' (Int.S1, S2, S3, S4,S5), 'joy' (Int. S2, S3, S4,S5) , 'active' (Int.S3, S4, S5), 'surprised' (Int.S1, S3,S4) and 'curious' (Int. S1, S3, S5) were the most frequent words that this group of interviewees used when asked to describe people's emotional reactions during their engagement with the interactive installations.

In terms of the combined results of UWIST Mood Adjective Checklistself on reported mood variations, as it can be seen in figure 7.19, we found a statistically significant and positive effect in the perceived tense arousal (stress) as feelings such as 'relaxed' and 'calm' had high mean values in all cases. This evidence is partly contradictory to the results of the study on the restorative potential of spaces, were the plaza was marked with negative values, something that as discussed in the previous section would lead to the conclusion of higher stress levels and lack of relaxation feeling. Generally, the installations placed at the Waterfront Promenade and the Enclosed Square seemed to cause intense feelings of energetic arousal and hedonic tone as 'happy', 'contented', and 'energetic' seemed to suitably describe their experience. On the other hand, the

engagement with the non-interactive illuminations of the Gardens as well as experience at the Plaza seemed to trigger rather intense feelings of passiveness.

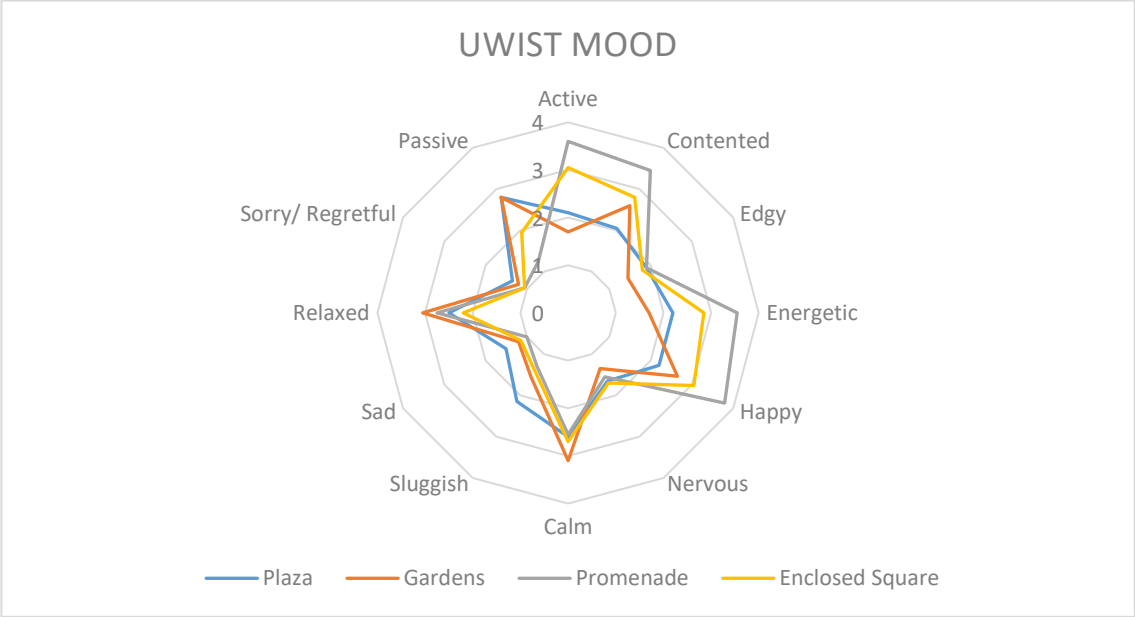


Fig. 7.19 Comparative graph of average UWIST mood self-reports in four public spaces during the presence of the installations

Figures 7.20 and 7.21 show the mean values of GSR metrics of the to groups of users that participated in the field experiment. As noted in section 5.2.4, to address concerns about order effects, two route patterns were created for the experiment; Route A: Plaza-Gardens-waterfront promenade- enclosed square and Route B: Enclosed Square-waterfront promenade- Gardens-Plaza. Generally, a higher value on the y-axis means more resistance (ohms) and indicates lower stress. **According to Thayer's (1989) two dimensional emotion model which combines valence (positive-negative) and arousal (intensity), higher stress values are not associated only with negative emotions of edginess and nervousness but also to the intense feelings of excitement and happiness. In that sense, the lower GSR rates identified during the engagement with Relax n' Release and the Spectrum in combination with self-reported emotions indicates the presence of high levels of excitement and happiness. Respectively, the lower levels of stress at the Plaza when related to the self-reported emotions of passiveness and sluggishness lead to the understanding that this experience was mainly perceived as rather passive and unexciting by participants.**

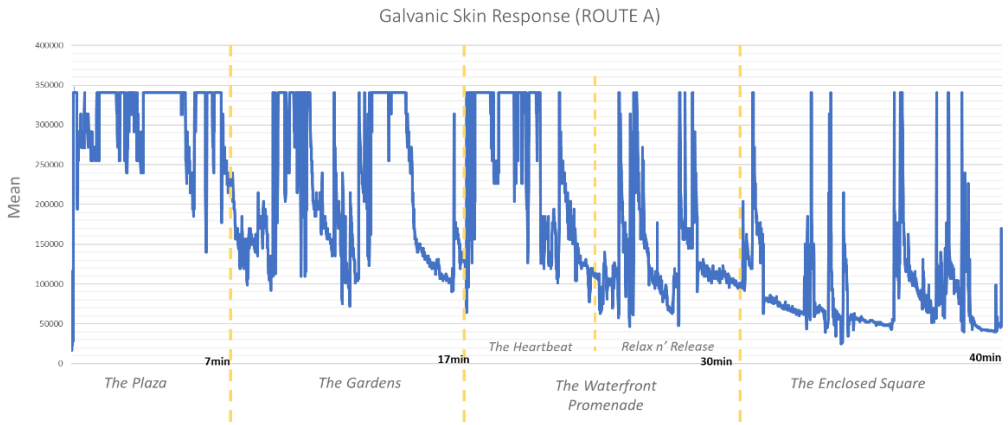


Fig. 7.20 Mean values of Galvanic Skin Response for field experiment's Group A; A higher value on the y-axis means more ohms and indicates lower stress

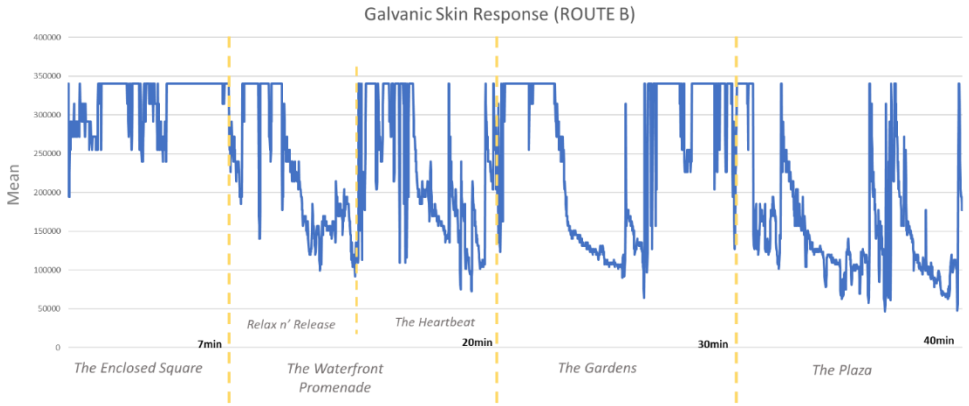


Fig. 7.21 Mean values of Galvanic Skin Response for field experiment's Group B; A higher value on the y-axis means more ohms and indicates lower stress

Data from on-site discussions with people (n=55) fundamentally confirm the aforementioned results regarding users' emotional response in the experience of each public space. For instance, the findings discussed above which are related to high arousal reflected on feelings of excitement and happiness is observed, also, in the positive emotional descriptions of the people. As seen in table 7.4, the words 'exciting', 'active', 'engaging' and 'cheerful' and very frequently used to describe people's emotional experience of their engagement with those installations. Respectively, the low levels of stress/ arousal found at the Plaza are, also, echoed in the descriptions of people such as 'dull', 'too sophisticated' or even 'intriguing' and 'curious' which is an expression that suggest higher cognitive rather emotional engagement.

On-site Discussions	Positive and neutral emotional response	Negative emotional response
Youth Culture	Intriguing (7), curious (5)	difficult to get (9), too sophisticated (6), dull (4)
Relax n' Release	Exciting (21), cheerful (9), active (13), magical (6), curious (5), playful (3)	-
The Heartbeat	Sweet (8), engaging (16)	Cheesy (5)
Gardens Illuminations	Festive (17), charming (4)	Boring (9)
Spectrum	Exciting (17), engaging (12), active (9)	dull (7), childish (10)

Table 7.4 Main positive, negative and neutral keywords in users' descriptions of their experience with each installation

*"**Magical** light event! It brings so much **excitement and joy** to people and the city. I must say that my favourite one was the interactive wall (Relax n' Release). It was awesome!"*

Liz, 32, user

Besides excitement and the feeling of being 'active' another expression commonly used for the description of individual's digital experience was the word 'curious'. This emerged, also, as a theme from interviews with professional psychologists who both stated that one of the main benefits of the engagement with such installations is that they are able to trigger human **curiocity and imagination** (Int. PS1, PS2, PS3); although these are conscious feelings critically related to affective experience but referring less to typical emotional responses.

*"People find it so much **fun** because they can **connect themselves actively with the installations** and can also include **their imaginative thinking**."*

Antigoni Grizi, Psychologist- play therapist (Int.PS1)

The idea of curiosity and imagination development can be, also, noticed in the descriptions of experiment's participants who were later interviews on the impressions of their overall experience. For example, Nadia expressed a desire for further exploration of the city through the application of even more interventions:

> *"**Unforgettable experience**, **transformed** the space into something different for the night. I would like to see more installations to a wider part of a city. For example create a "treasure hunt" so that people can get from one installation to another crossing different parts of the city."*

Nadia, 29 (Int. P1)

While Rob and Vasilis emphasized on the playful and explorative character of this digital initiative:

> *"**Vivid**, very good vibes, happy people all around, **curiosity to explore** and see all the installations"*

Rob,34 (Int.P4)

> *"Very **explorative**, spent more time to the area than usual. **I didn't like all the installations but** I liked the interaction and the process; I liked that I had to look around for the installations and think about what and if they mean something and what they do."*

Vasilis,35 (Int.P5)

The application of digital installations and the engagement with them, however, is not always positively related with the perception of public space in terms of their level of 'artfulness' and 'fineness'. An interviewee indicated that although media interventions managed to make public realm more lively, he would prefer a more 'artful' and creative form of performance art or an outdoor theater:

> "I found the whole thing a bit **dull**. I realise that the installations made the place more vivid than a usual cold winter night but I would prefer to see an outside theatre for example rather than lifeless "robots".

Peter, 43 (Int.P6)

Creations of feeling of ‘surprise’, ‘reward’ and ‘joy’ through the engagement with the media installations emerged as a pattern in the interviews with the designers, particularly those of the Heartbeat and Relax and Release (Int. D2, D3), The highlighted the fact that, for them, it was highly important to design an art installation that initially would attract people without really knowing how it might works, surprise them with its function and reward them by letting them engage into a joyful interactive process (ibid).

Evaluating affective perceptual impact through Instagram data

Digital ethnography was, also, carried out to evaluate the impact of the physical transformation of the urban setting in the environmental images uploaded by people on Instagram platform. Particularly, the studied images and respective captions and comments were identified in the digital platform through the tag *#LightWaves2018*. The data were collected using Instagram API which extracts posts for any hashtag or locations on Instagram and, finally, analyzed to find any potential patterns related to users’ perceptual experience.

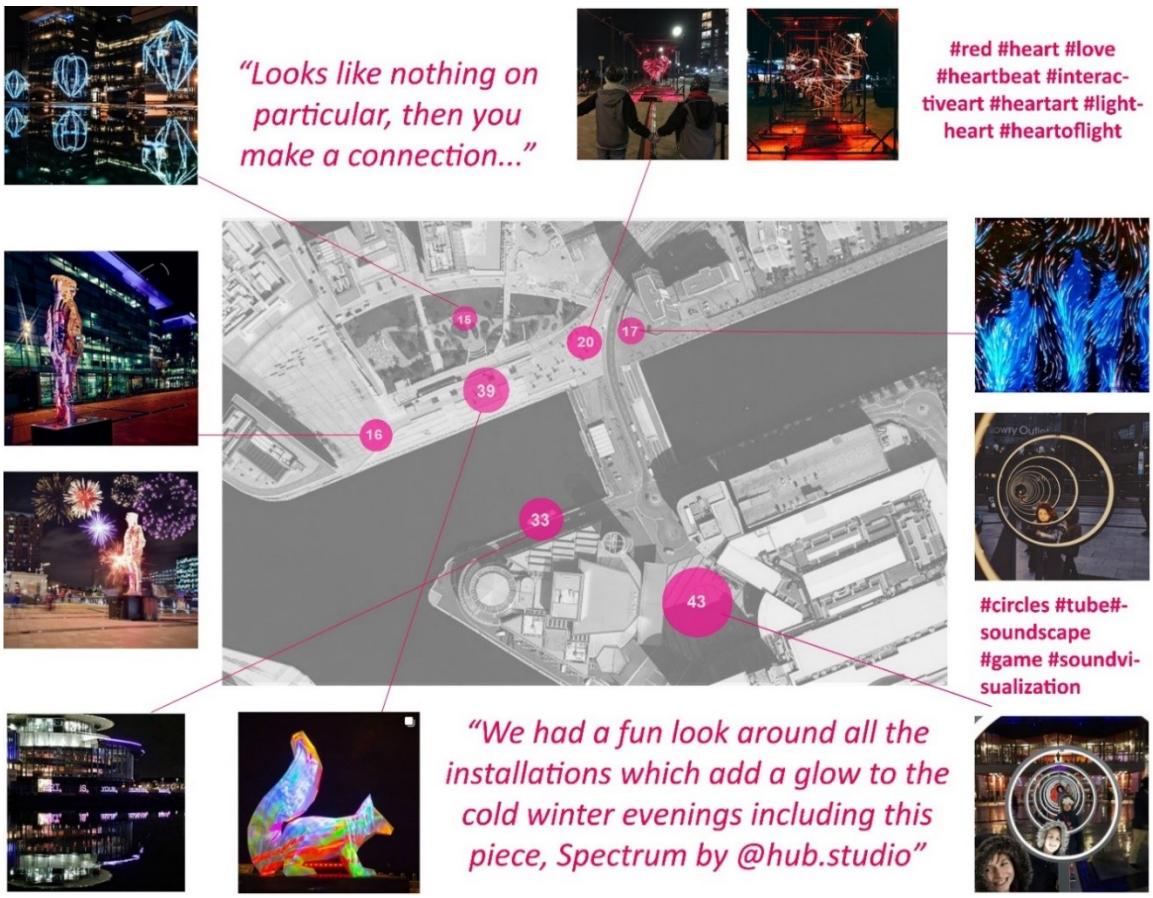


Fig. 7.22 Distribution of Instagram posts with the hashtag #LightWaves2018 throughout the site area

However, the results from this method were slightly different than expected and, in some cases, even contradictory to previous findings. For example, in terms of frequency of posts, the most 'instagrammable' places/ installations were: a. the Spectrum (n=43), b. the non-interative sculpture The Squirrel (n=39) and c. the non-interactive and unapproachable digital sculpture 'Art Is Your Human Right' (n=33) placed at the South edge of the canal, connected only visually from the north side of it (fig. 7.22). The two latter installations, although being part of the event, were out of the scope of this study as, during the field studies, it was noticed that they did not have a particular impact on the study area in terms of activity, urban dynamics and social interaction. Especially in terms of the waterfront promenade which was a critical unit of the overall case study, it was clearly observed that the two installations with the major effects at the area were the Heartbeat and Relax n' Release and, thus, chosen to be analyzed instead of the non-interactive Squirrel. **Therefore, it was realized that the 'instagrammability' of a place does not necessarily reflect its actual experiential quality. Pictures shared in this platform are often taken from spaces 'codified and recognisable' with overwhelming features such as overly bright colours and lights that make them distinctive (Jennings, 2019).** So, although, the triangulated findings from aforementioned methods showed that the installations most rich in experiential elements from an affective perspective were the Spectrum, Relax n' Release and the Heartbeat, only the first was included in the list of the most popular interventions on Instagram (see also fig. 7.23-7.27).

> *"What looks good in a photo is a very shallow, static backdrop with a bright colour or scintillating pattern.* ***But that has very little to do with comfort or flow or dwell time, which require depth and choreography and, usually, places where the eye is more attracted to the people you are with than to the decor****."*
>
> Mackie, 2018, para.20

Fig. 7.23-7.25 Samples of Instagram posts from Youth Culture, the Heartbeat and Gardens Illuminations (https://www.instagram.com/explore/tags/lightwaves2018/?hl=el)

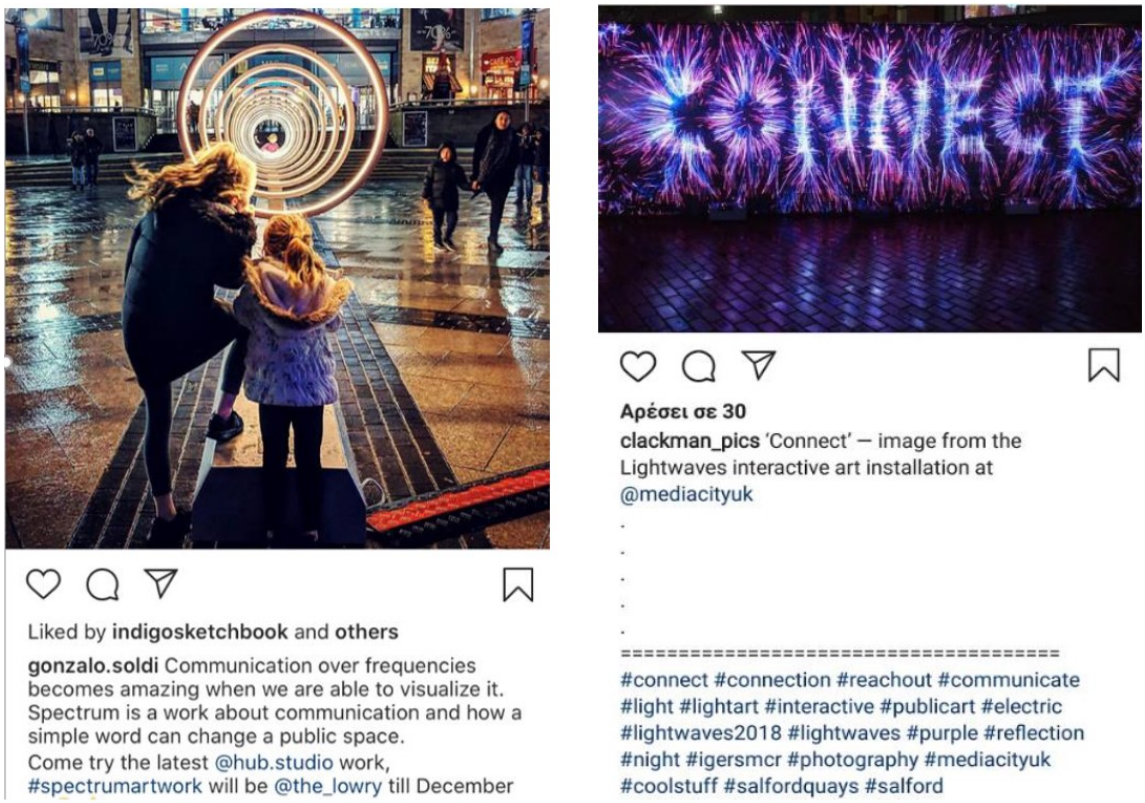


Fig. 7.26- 7.27 Samples of Instagram posts from Spectrum and Relax n' Release (https://www.instagram.com/explore/tags/lightwaves2018/?hl=el)

Some further, qualitative, analysis of the Instagram data and meta-data, however showed some more interesting results. As seen in table 7.5, some highly frequent concepts and descriptions related to the overall event as a creative experience were found to be those of 'art', 'captivation', 'exploration', 'fun' and 'public engagement'. The sense of exploration

as well as feelings of fun and captivation generally confirm the aforementioned findings in terms of people's affective experiences. **Hashtags also reveal interesting aspects of perceptual experiences, such as senses of creativity and exploration**. **These ideas, again, align with users' own experience evaluation when asked during interviews and on-site discussions, as well as with psychologists insights regarding the triggering of curiosity, creative and imaginative thinking through the engagement with such installations.**

Installation	Popular hashtags*	Popular descriptions and concepts (in captions and comments)
Youth Culture	#interactive, #digitalart, **#exploretocreate, #urbanexploration**	**Art** (also as public art, interactive art, digital art, urban art, light art, piece of art, artwork, street art, night art) **Captivating** (also as mezmering, alluring, fascinating) Spectacular displays **Exploration** (also as discovery) **Fun** (also as exciting, cool, uplifting) **Public engagement** (also as participation)
The Heartbeat	#heartoflight, #heartbeat , #love, #heartart, #redheart, #lightsculpture, #exploretocreate	
Relax n' Release	**#Createart**, #lightart, #interactiveart, #digiatalart, **#exploretocreate**	
Gardens' Illuminations	#Lightart, #digitallights	
The Spectrum	#**exploretocreate**, #artofvisuals, #soundscape, #soundwave, #publicart	
***the popular hashtags exclude those merely related to location (such as Manchester, MediaCity, etc.) or are generally poor in experiential qualities (such as 'streetphotography', 'illuminations, etc.), which although have been particularly frequently used, they could not contribute in any way to the study of users' perceptual experience**		

Table 7.5 Most frequent hashtags for each installation and most common descriptions regarding the whole experience of the digitally augmented spaces on Instagram

c. Psychological Restoration and wellbeing

People's need to retreat from over-stimulation, relax and recover from stress caused by environmental and non-environmental factors is broadly acknowledged, and places that include natural elements such as green and water have been proved to be particularly restorative (Kaplan and Kaplan, 1989; Carr et al., 1992). However, research has also

found that restorative environments are those providing people certain experiential qualities. These involve: a. the sense of being away (physically or mentally) by allowing the mind to travel, broadening in this way the extent of what is normally experienced; b. a sense of fascination or psychological engagement; c. compatibility with person's preferences and expectations (Kaplan et al., 1998).

*"Outdoor interactive installations give people the opportunity to experience new things or even **mentally travel**…"*

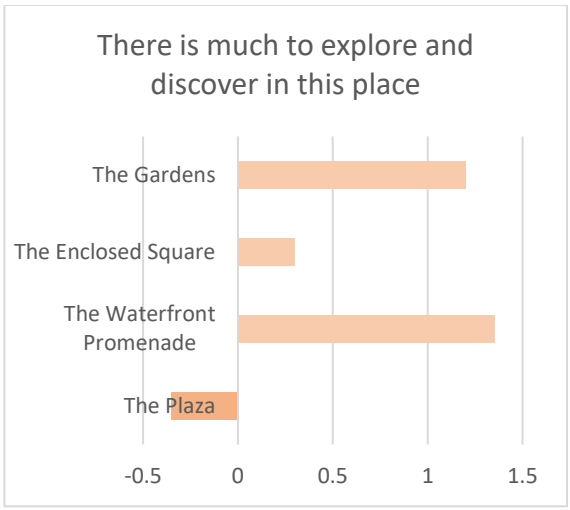
Michaela. Kekeri, Urban Designer (Int.UD1)

In that sense, it has been suggested that other types of environments, besides natural, can be restorative (Karmanov & Hamel, 2008; Thwaites et al., 2013, Staats et al., 2016). In this study, it has been hypothesized that digitally enhanced environments can serve as restorative environments and therefore a set of relevant questions were included in the psychometric tests of the field experiment. In this context, in the interview with professional neuroscientist, when asked about his view on the restorative potential of such environments he stated:

*"Maybe. We normally think of ART (attention recovery theory- related to restorative environments) in the context of nature exposure but **other kinds of experiences may also be restorative**."*

Collin Ellard, Psychologist-neuroscientist (Int.NS1)

The psychometric tests sought to measure the restorative potential of each of the public spaces separately by measuring the impact of each setting on each one of the aforementioned critical experiential qualities. Therefore, people at each space after engaging with the digital interventions were asked to evaluate their sense of being away (Restorative Quality 1-fig. 7.28), their level of fascination (Restorative Quality 2- fig.7.29) as well as the level of compatibility they felt with the surrounding (Restorative Quality 3- fig.7.30).



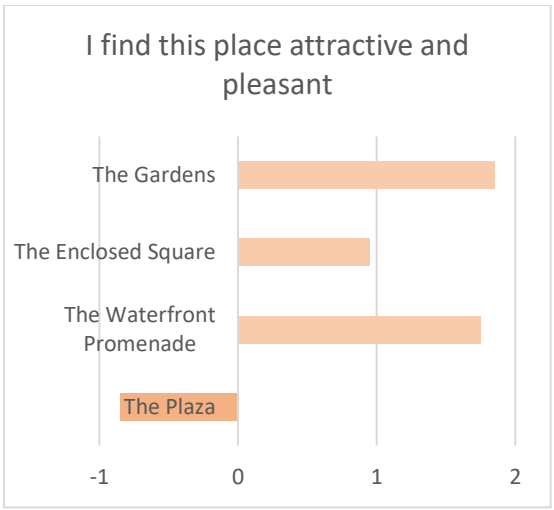


Fig.7.28 Comparative bar graph showing the average level of sense of exploration and discovery at each public space after their digital augmentation (Restorative Quality 1)

Fig. 7.29 Comparative bar graph showing the perceived level of attraction and pleasure at each public space after their digital augmentation (Restorative Quality 2)

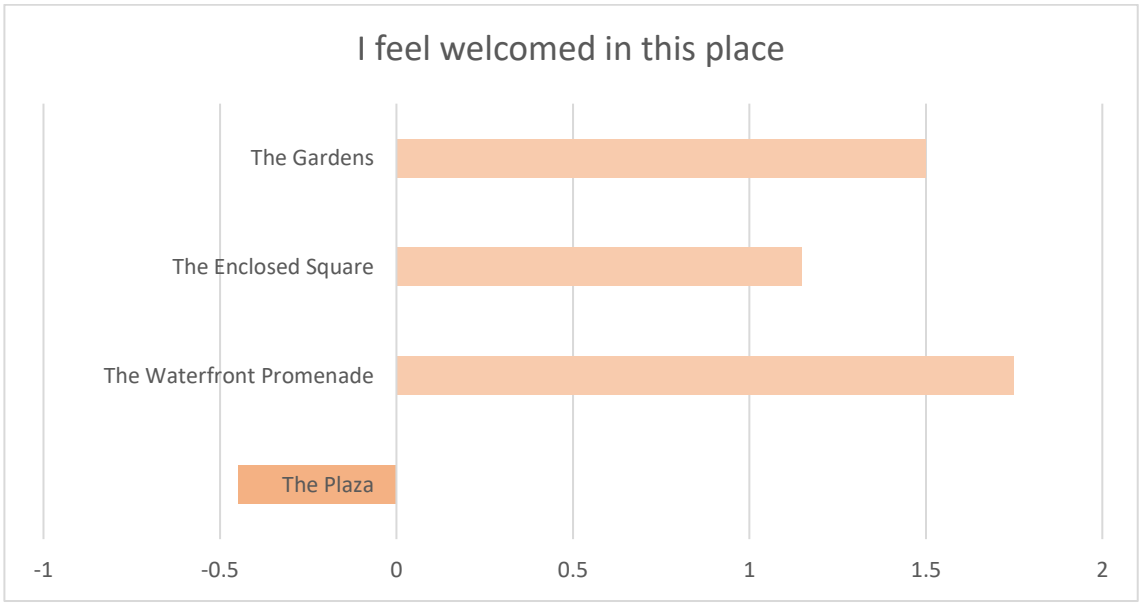


Fig. 7.30 Comparative bar graph showing the perceived level of welcomeness and compatibilitperceived level of welcomeness and compatibility with the surrounding at each public space after their digital augmentation (Restorative Quality 3)

As shown in figures 7.28-7.30 as well as table 7.6, the Waterfront promenade and the Gardens were the places with the higher total score of restorative qualities, while the Plaza was the only public space marked with negative values which implies that people felt uncomfortable and stressed during their presence. The two public spaces with the highest scores both include the natural element in them (water element at the promenade

and green element at the gardens), however this element is far more intense at the case of the Gardens; people at this setting are surrounded by and are in constant contact with vegetation. Furthermore, as discussed in section 6.1, the overall public space configuration of the Gardens is much more human-friendly (enclosure, active edges, multiple paths, no cars). **Yet, the public space with the highest restoration score is the waterfront promenade, although the locations of the installations were not that advantageous in terms of human 'friendliness' due to the lack of enclosure and high exposure to vehicular traffic. This possibly enhances even more the psychological restorative effect of the digital interventions in the area.**

Restorative Qualities	The Plaza (Mean)	The Waterfront Promenade (Mean)	The Enclosed Square (Mean)	The Gardens (Mean)
There is ***much to explore and discover*** in this place (R1)	-0.35	1.35	0.3	1.2
I feel **welcomed** in this place (R2)	-0.45	1.75	1.15	1.5
I find this place ***attractive and pleasant*** (R3)	-0.85	1.75	0.95	1.85
Σ(R1+R2+R3)	**-1.65**	**4.85**	**2.4**	**4.55**

Table 7.6 Comparative table of the restoration scores for the four case study units

Psychological resilience and wellbeing

*"Strolling around the different artworks and looking at the variations of lights and colours cheers me up**. Especially when I feel lonely the combination of installations, visitors and play makes me feel like I'm less alone**."*

Serjio, 29, user

From the broader psychological perspective, it needs to be noted that participation in creative activities is highly beneficial for human wellbeing (Fancourt et al., 2019). Particularly, research studies show that creative self-expression assists individuals to process their thoughts and feelings and allows them to cope better with mental health challenges, such as depression, making them eventually more resilient (Leckey, 2011). In that sense, all three interviewed psychologists identify this potential contribution of interactive installations in human mental and emotional state:

> *"Urban media installations definitely provide positive and happy feelings and definitely **make people share moments, meet new people and socialise**. Especially the fact that they are public offers people the **chance to 'co-explore'** and meet people easier having a common factor as a trigger.[…] I would say that such interventions could even enhance the psychological and social sustainability of a public space due to a feeling of sharing and happiness which make people feel **safe and contained** so possibly caring more for one each other and the environment around them"*

Valia Papadopoulou, Psychologist (Int.PS2)

> *"They can start exchanging comments regarding how the installation works and how they might be able to play together with the installation, if requires two people to be in operation. Therefore, it is very likely people to start feeling **less lonely, more sociable and friendly with each other**, **and to bring back days that relaxing moments and social warmth was the norm and not a rare event**."*

Antigoni Grizi, psychologist- play therapist (Int.PS1)

> *"Public art installations may also support positive mental health and well-being directly by helping people to **reflect upon their experiences, express their thoughts and emotions, and facilitate creative insights** into the state of one's own mind"*

Adam Powdrill, psychologist (Int.PS3)

A very common mental health issue, especially in northern contexts like UK is seasonal affective disorder (SAD). This is a type of depression that occurs in a seasonal pattern, during the winter, and it is primarily associated with the lack of sunlight (Rosenthal et al., 1984). According to NHS, around 2 million people in UK and more than 12 million people in northern Europe suffer from SAD (https://www.nhs.uk/conditions/seasonal-affective-disorder-sad/). During this period of the year artificial light can be an effective tool against seasonal affective disorder (ibid) and , therefore, innovative and creative lighting ideas could augment daytime lighting during the months when availability and intensity of it is restricted (ARUP, 2015). The professional neuroscientist suggested that with thoughtful

design interactive light installations can act as tools of public light therapy (Int. NS1). In the same context, the interviewed psychologist stated:

> *"Winter can bring more nostalgia, loneliness, isolation and negative experience in people. Having something to entertain them physically or just by seeing it can be very powerful.* ***Having a nice view of lights, motions give a nicer picture in the space but provides people with hope for something better****. The positive feeling can be short at times while only during the interaction with the installation for people but can definately make a difference in their day and mood in general."*

Valia Papadopoulou, psychologist (Int.PS2)

7.3.2 Bodily Engagement and Self-expression

As discussed in section 3.2.3 bodily engagement and kinesthetic experience with the environment constitutes a very significant indicator of individual's perceptual experience in space as it reflects the level of stimulation this space affords. Urban media installations offer various opportunities for embodied engagement and, also, as noted in section 7.2.2 their type of engagement most of the times involve a high level of *playfulness*. This characteristic seemed to make the studied installations even more appealing to people, regardless the user profile.

> *"**It's difficult to turn down an invitation to play**, and often we don't have enough opportunity to do that in our everyday lives, particularly as adults."*

Jennifer Taylor, Quays Culture (Int. C1)

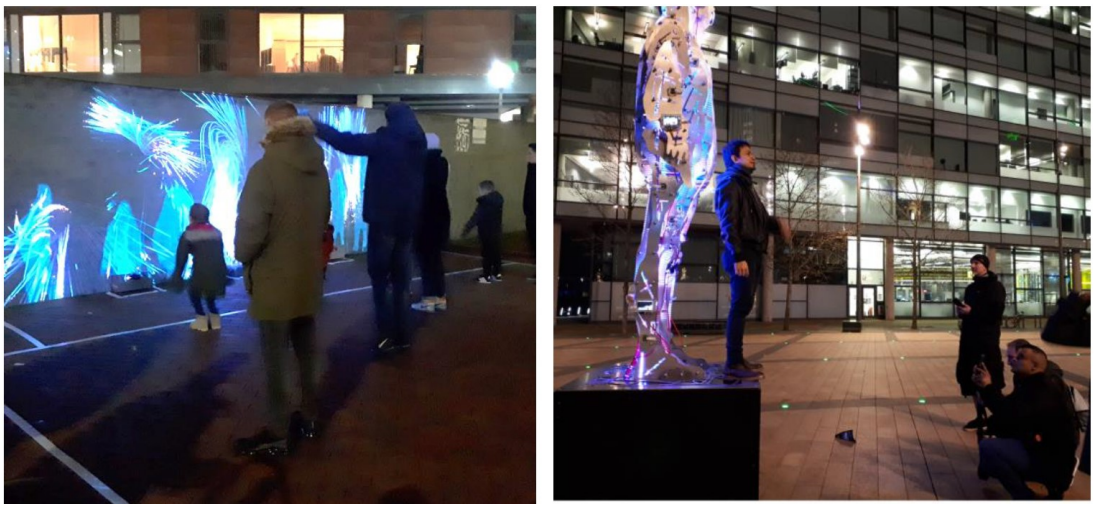


Fig. 7.31, 7.32 Playful full bodily enagement with media installations and improvisation

This section focuses particularly on the way users' perceptual response is formed through the (playful) bodily encounters they create with installations and the spatial context aiming to trace the place experience from a physical and bodily perspective. The field observations support the idea that users' bodies were often in action and movement during their engagement with all of the installations. This happened both because of their nature and concept (for example Relax n' Release required human movement to function) as well as because of people's need for exploration. People, for instance, would walk around the installations, examine its structure and interactive features from different perspectives, approach it and touch it, creating various predicted and unpredicted embodied encounters (fig. 7.31, 7.32). The digital installations also allowed and triggered a number of non-instrumental, exploratory and risky forms of play behaviour.

However, during the on-site discussions with users as well as the interviews with participants there were no references to their bodily activity. This suggests that although people's actions were conscious, they probably did not realize their association to their overall experience of place and their own bodily encounter remains unnoticed by them. Yet, noticing other people's gestures and moves as a source for laugh and dialogue initiator was often mentioned.

The interviews with installation designers revealed that all of them intended to trigger playful bodily engagement through intense kinethetic experiences and embodied self-expression and they saw their artwork as a piece for spontaneous physical encounters that would creatively interrupt people's everyday routine in public space (Int. D1, D2, D3, D4). In this context M. Almena's perspective on the contribution of Relax n' Release's encounters almost illustrates the definition of play and its value in the everyday urban experience:

> *"**Our installation gives people the opportunity to be silly, playful and less serious in a regular, heavy and dull routine**. […] It was significant for us to design an artwork that requires bodily and visual engagement at the same time in order for users to feel immersed into the experience. This form of multiple stimulation of body and senses makes user more engaging and the while experience more powerful"*

M. Almena, Kimatica Studio (Int. D2)

Professional psychologist-play therapist described people's bodily engagement with the installations as a motivation for body transformation and creative expression that enhances individuals' self-realization and identity.

> *"The fact that they can see their body getting transformed, change shapes and colours, and become something more abstract and fluid, gives them a new perspective about their bodies, a recognition of the body that was not present before. I think it increases the sense of bodily preferences. People come to a realisation about their self-identity through their thorough analysis of their image. In the videos that I saw, there is an eminent feeling of movement liberty and body celebration"*

A. Grizi, psychologist-play therapist (Int.PS1)

Furthermore, she highlights the fundamental role playful interaction with media installations can have in emotion and feeling expression as well as the development of creativity and art skills:

> *"Through the play with the installations they can express anger, need for calmness, need for change, irritation, hope, despair, and other feelings. It depends on the colours, effects, and way of operation of every installation for the emotional reaction of the adults. However, whichever the reaction would be, I think it will help the people to express their creativity, their artistic talents and skills, and to become more aware of the emotions that are held in the body but not often projected and shared with the outside world."*

Antigoni Grizi, psychologist-play therapist (Int.PS1)

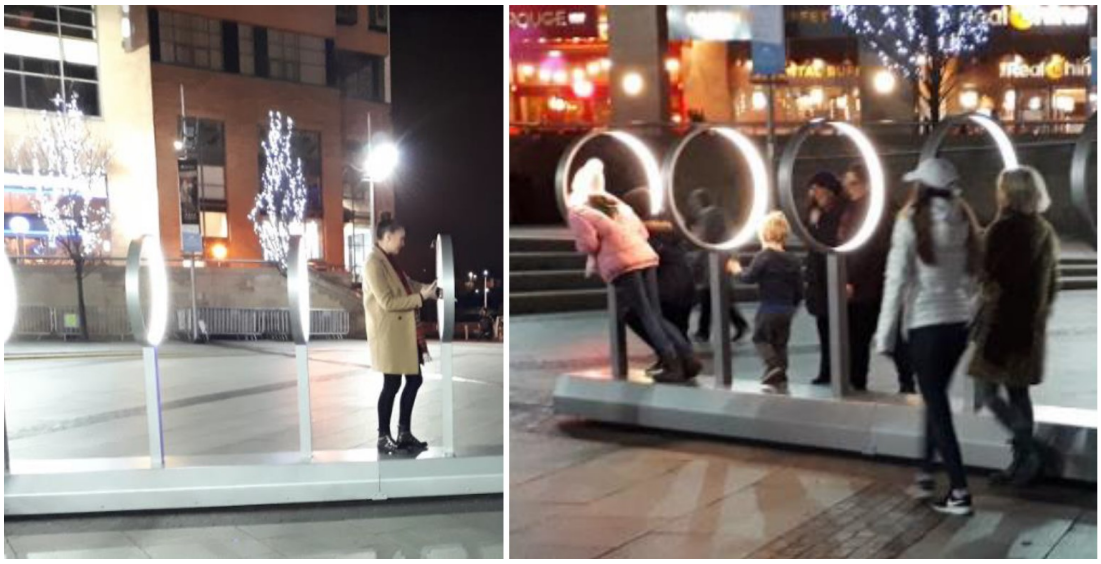


Fig. 7.33, 7.34 Physical exploration of the Spectrum installation by the users

The third interviewed professional psychologist, also, emphasized in the significant role of such embodied sensory experiences in making the cities less 'grey, unforgiving and inhuman', or in other words placeless, as discussed in chapter 2, by adding some positive and stimulating sensory affordances (Int.PS3):

> *"Digital art installations would be one great way to help to combat this issue by introducing new, exciting, and "rare" sensory opportunities for members of the public. Art installations such as the ones in the videos provided above would help to facilitate people communicating with each other non-verbally, through the use of their bodies and senses and would thus provide an important opportunity for sensory experience and development."*

Adam Powdrill, Psychologist (Int.PS3)

7.3.3 Opportunities for Personalization and Connection to Space

*"**The best public spaces inspire improvisation**. By making space for and promoting unplanned, informal activations of a space a public space can fulfill its potential as a place that people truly make their own."*

Project for Public Spaces, 2018

Another significant theme, in terms of people's perceptual experience in the digitally enhanced public space, that emerged both through field observations as well as in multiple interviews, which is also closely related to the notion of bodily engagement, is that of *space personalization*. **Ultimately, this concept encompasses all the creative expressions and forms of territorial behaviour and space appropriation noticed during the physical engagement with installations and which are undoubtedly associated individual's perceptual response at these moments**. According to PPS (2018) there are various indications of space personalization by users in public realm. One of them refers to *triangulation* which actually suggests that the nature of the design of a certain activity or intervention in public space is such that enables the generation of additional uses (as seen in table 7.2). Another feature of personalization is the placement of *entertaining features in public space*, such as music, dance or other creative expressions that can initiate unpredictable interactions. Finally, users' improvisation of seating by physically engaging with urban furniture through "perching" or leaning, as well as *improvisation* in general by finding new spatial interpretations of urban objects is a fundamental element of space personalization and territorial behaviour in public space (ibid).

During field observations a high number of personalization gestures and territorial behaviors were noticed, most of them taking place with Youth Culture installation (at the Plaza), the Spectrum (Enclosed square) and Relax n' Release (waterfront promenade). As discussed in section 7.1.3 these were the installations that mainly provided opportunities for experimentation and performance and were therefore described by the users as spaces to 'perform', 'mimic' and 'exaggerate'; concepts all related to the notion of personalization. In contrast to Gardens' Illuminations and the Heartbeat, which were found to offer less chances for appropriation, the more equivocal artworks proved to be variously engaging and with a high level of creative potential (see fig.7.35-7.38). Due to their form that provides a number of physical elements to play with as well as due to their more ambiguous concept and complex

digital function, the tree aforementioned interactive artworks provided opportunities for seating, climbing, perching, creative play and several additional imaginative interpretations (fig.7.35- 7.38).

> *"Some territorial gestures may be **fleeting and theatrical**, or may be more enduring expressions signalling occupation and personality. Urban structure needs to be configured to encourage and accommodate territorial behaviours of all kinds **giving texture and life to urban order**"*

Thwaites et al., 2013:42

Fig.7.35-7.38 Personalization gestures and territorial behaviors during engagement with installations (https://www.instagram.com/explore/tags/lightwaves2018/?hl=el)

Space personalization and territorial behavior has been associated with multiple aspects of individual's perceptual experience in a setting. For Brower (1976) it is related with the feeling of place attachment and sense of familiarity, while for Feldman and Stall (1994) this interactive process implies that people infuse place with meanings and then in turn the place transforms themselves. Finally, for Twaites et al. (2013) and Gifford et al. (2011) link space personalization and territoriality with feelings of self-identity, self-determination and safety.

Indeed, in several interviews it was suggested that space appropriation behaviors were and should be encouraged as they enable the active connection of people to the installations and surrounding context (Int.UD1, C1) as they, ultimately, reflect psychological processes by which space is converted into place and therefore the respective experience is enriched (Int.PS1, PS2). In that context, the professional psychologist noted that when people customize their experience in public realm it is like *"they make themselves at home in this setting by identifying new opportunities and creating their own stories"* (Int. PS2). From the perspective and past experience of the curators, Taylor (Int.C1) highlights that the most important aspect of the installations is not the design itself but how people use it, the emergent activities and the opportunity to have an effect on it.

"I think people enjoy being able to impact on an artwork, ***and having a role to play in bringing the artwork to life****"*

Jennifer Taylor, Quays Culture (Int.C1)

7.3.4 Space (re)Conceptualization through Media Art: Creating new meanings and identities

"Public art is ***a reflection of its place and time****. It acts as a* ***place marker*** *in all human settlements."*

Public Art Network Advisory Council, 2018: 2

Places are mainly memorable and conceptualized for two reasons; the social and experiential associations that they create (Stokols, 1981) as well as their physical form (Lynch, 1960). As urban space becomes increasingly layered with new social and experiential qualities, the interrelationship of physical, conceptual, perceptual and social elements, consequently, is thought to increase as well (Thwaites et al., 2013). In the context of this study, the aspect of art and, particularly, the form of public urban art is a rather distinctive element of the studied digital interventions that fundamentally influences and transforms users' conceptions regarding the area. According to Heath and Pavlaki (2019), urban media art being able to affect both the image as well as experiential dimension of the city is able to inscribe new meanings and identity to places. So what has actually been the role of art in the perceptual experience of the site? That concept emerged as a theme in various sets of interviews; with designers, experts as well as those with events' participants.

As discussed in section 7.1.2, public art installations can act as visual devices that form focal points and (re)connect users with their surrounding environment by encouraging them to pay attention to it. However, public art can also do a lot more than this; it can inspire people to question what is around them, find new local identities and inscribe meanings which can make people feel a sense of pride for their place, especially in newly built areas that lack the resonance of significant historic qualities and character (Public Art Network Advisory Council, 2018). The site area of MediaCity UK constitutes a place like this. In such contexts thoughtful public art interventions can enrich the environment with new ephemeral qualities, celebrate its urban character by making it essentially make it different than others and restore its vitality (ibid).

The interviewed urban designer highlighted that urban media art, as a form of public art, could act as a catalyst for placemaking provided it enables a high level of community engagement and it is compatible with the design and context of public space where it is located. Therefore, besides its aesthetic quality public media art can become a key aspect of the cultural identity of a place (Int.UD1).

From a more conceptual perspective, a theme that emerged from interviews with the media designers is the idea that they all aimed to create a form installation that being publicly engaged would act as platform to convey various messages or provide a particular experience (Int.D1, D2, D3, D4), supporting in this way ideas such as socially engaged art (Helguera, 2012) and art as experience (Dewey, 1934). As discussed in section 7.2.1 and chapter 6, all designers wished to promote different ideas and conceptualizations of public space through their artwork; either through the creation of a 'mystical immersive' experiences (Int.D3), through challenging concepts of 'social alienation' (Int.D1) or through celebrating the value of (physical) human communication and connection in the city (Int.D2, D4). Ultimately, all designers stated that public space should be seen as a social space for communication, expression and inspiration; a space for art (Int. D1, D2, D3, D4).

Interviewed psychologists also recognized the importance of urban media art as a form of public art for individual's everyday experience in the city. A. Powdrill (Int.PS3) noted that human beings having the unique ability to engage in imaginative and insightful activities, like art, which benefits their communication, self-understanding and wellbeing, can benefit even further from forms of art that are interactive, public and promote the social aspect.

> *"I feel that adults would benefit both socially and in terms of their creative expression. Research has linked demonstrated links between engaging in art and other creative activities with greater* ***interoceptive awareness*** *- something which is critical in terms of understanding ourselves and managing our feelings on a day-to-day basis. Providing opportunities for adults to express themselves in a variety of different ways is important, as* ***everyone expresses themselves and understands themselves in different ways****. Large scale art installations are great in that they can be interpreted in many different ways, allowing multiple people to engage with and understand them differently."*

Adam Powdrill, psychologist (Int.PS3)

In a similar sense, Papadpoulou (Int.PS2) emphasizes on the significance of curiosity and imagination, as also discussed in section 7.3.1:

> *"Urban media installations as a form of art can stimulate curiosity which in turn activates imagination and further thinking. Such artworks get the audience to be involved , **to use the resources (if they can) with their own way, to identify what it is, to make their own story**."*

The positive effect of art in user's perceptual and conceptual experience of public space was not only identified in the interviews with professionals and designers. Its actual constructive impact was also recognized by the even't participants during the in-depth interviews with them.

> *"This is my favourite kind of art and I'm so glad to see all those wonderful pieces! I must get to all these outdoor exhibitions. **Actually they're like an art trip in the city!**"*

Kate, 32 (Int.P3)

> *"Although some of the installations could be a little more interactive, I really enjoyed the experience especially in the sense that **these pieces of art are for everybody and belong to public space**"*

Rob, 34 (Int.P4)

> *"I've been looking forward to the event for a long time! I love the fact that we get the chance to interact with amazing pieces of digital art.[…] This kind of **creative happenings** actually confirm to me how lucky I am to live in Manchester!"*

Brittany, 28 (Int.P2)

The following diagrams show a summary of all themes related to place experience in digitally enhanced environments identified through the entire data analysis process (fig. 7.39) , as well as the interrelationships between them (fig. 7.40).

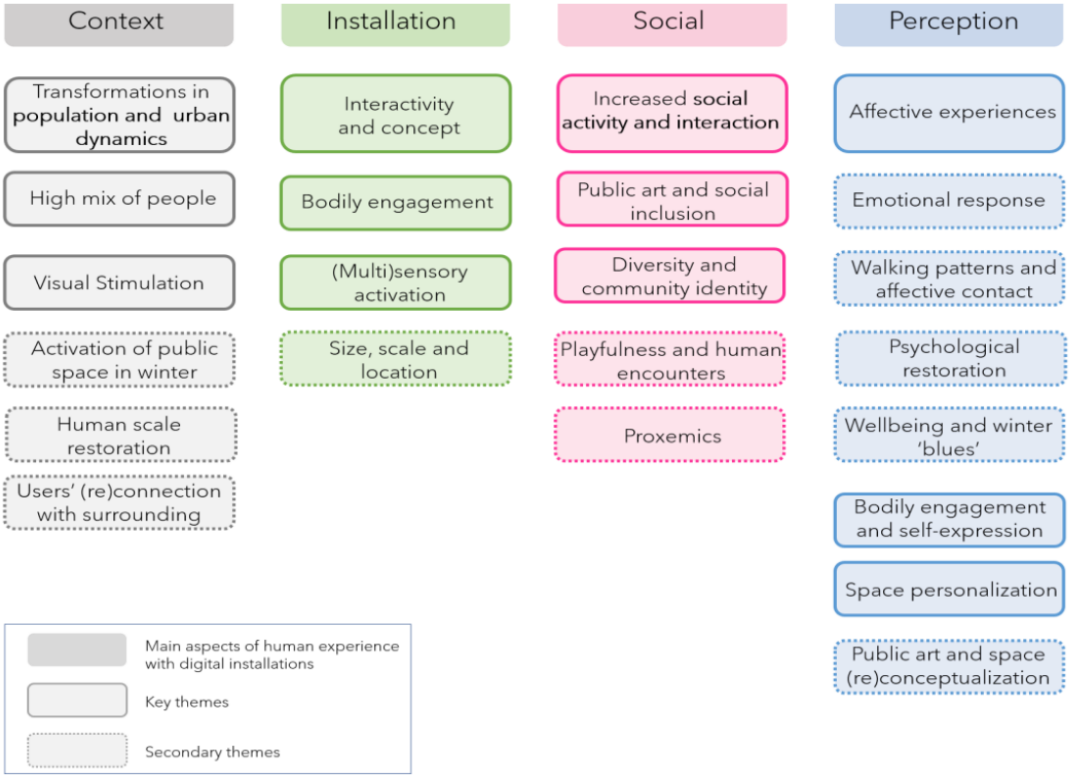


Fig. 7.39 Summary of themes related to place experience in digitally enhanced public space

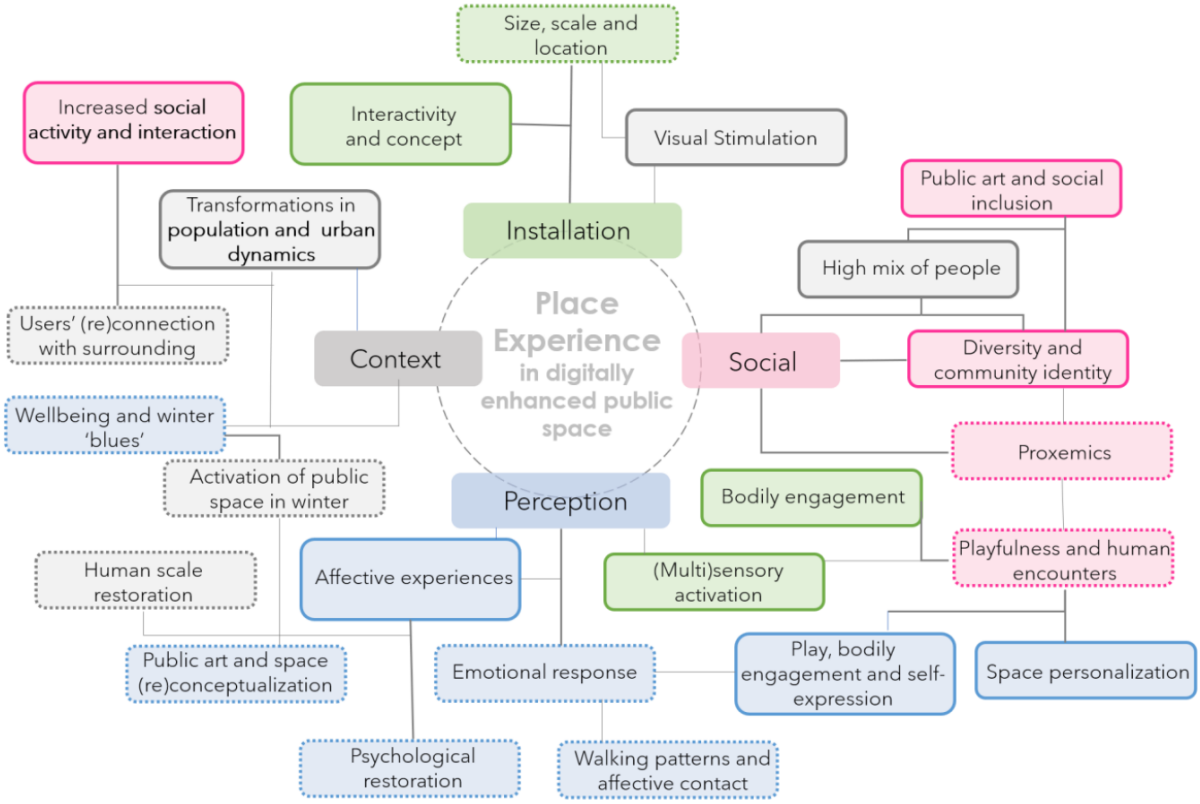


Fig. 7.40 Summary of the interrelated themes that emerged from data analysis regarding place experience in digitally enhanced public space

Note: The diagram shows the complex relationship between themes. Connections indicated are not exhaustive as several of the themes are related to multiple factors

CHAPTER 8

Discussion

This chapter includes a summary of the key findings that emerged from the data analysis and links them to results and theories from previous research of relevant topics, while also discussing the relationship between study's results and research objectives and questions. The case study analysis, carried out both across the four embedded units separately as well as an entire network of digitally augmented public spaces, aimed to understand the relative contribution of media interventions to place experience in public realm in accordance to the overarching aim of this research study. Through a comprehensive exploration of the multiple aspects of human experience in space, based on different methods and techniques, various transformative effects have been identified regarding the implementation of digital interventions in urban space.

In this respect, it can be argued that the holistic approach in this research study has ultimately established the key features and qualities of human experience through the interaction with media installations in public space. The contextual analysis of the site area was based on a spatial appreciation as well as behavioral analysis of urban dynamics. The social analysis approach has studied the effects on public space as a social space exploring transformations in terms of human interaction, community activity, participation and social connection. Finally, the perceptual analysis has looked at the implications on individual's feelings of space regarding multiple complex aspects of perceptual experience. The following sections will discuss the fundamental themes that emerged from all the aforementioned approaches in relation to place experience affordances, contribution to the process of placemaking as well as considerations for media installation design.

8.1 Affordances of Media Interventions in Place Experience

Research findings suggest that media art and architecture interventions that actively integrate human engagement have the ability to fundamentally transform place experience in everyday environments. This section will discuss how a digital installation can act as key mechanism to promote space livability, articulation, public participation and consequently urban social and psychological balance.

8.1.1 Public Space Activation and Revitalization

As discussed in section 2.3.2 contemporary urban spaces tend to become less stimulating, uncomfortable for human interaction, poor in social connections and people-place bonding, essentially placeless. Sennett (1994:366) has described this form weak human experience in contemporary city as following:

> *"Individual bodies moving through urban space gradually become detached from the space in which they moved, and from the people the space contained. As space became devalued through motion, individuals gradually lost a sense of sharing a fate with others. […] Individuals create something like ghettos in their bodily experience"*

In this context of human-space 'detachment', the implementation of creative digital urban interventions can have some valuable and even positively surprising effects both on individual's experience in terms of their behaviour, feelings and space perception as well as on public space as a broad system that facilitates and reflects city's dynamics.

Data analysis revealed the potential of urban media art and media architecture to trigger human engagement and create new activities in certain urban spaces. Essentially, the critical role of the digital element incorporated in these urban artefacts is that by embedding new **technologies it allows people to interact with art and architectural objects and, thus, becoming 'actors' in a public performance. Therefore, people's everyday city experience is enriched by a happening that attracts them and requires them to change their normal routine, even for some moments, by performing and also watch others' performance.** As a result, public realm acquires lively spaces, where users may interact with the media intervention or one another, or even just stay passively to observe the activity. In this sense, Gehl (2011), having explored the concept of public space activation and vibrancy in relation to human nature and pedestrian behavior, states: *"precisely the presence of other people, activities, events, inspiration and stimulation comprise one of the most important qualities of public spaces altogether"* (p.15).

In this respect, what emerged from data analysis was that this form of interventions not only attracted people to engage with the installation following the process of their actual operation but they also triggered a number of subsequent mainly informal activities which in turn attracted even more people. People coming alone or in groups resulted taking part in this collective experience, a lot of times just spontaneously, creating a form of common informal happening. During the process they met the same strangers as they followed the same or similar trajectories in order to visit and discover all the installations, and this type of 'sharing goal' made them more open to communication and social connection. Furthermore, this new interactive and temporary layer of interventions in public realm made people want to explore it and attracted large audiences who wanted to participate in the experience and engage with the different installations and the overall experience. **So, ultimately, although public space was initially augmented by technology through the allocation of the media artefacts the final and most powerful enhancement was through people and human dynamics.**

The potential of networks of art installations as tool for urban renewal has been, also, identified by Nyca (2010) through studied carried out in public spaces of Gdansk. They found that this type of 'micro-interventions' acted as a catalyst towards the transformations of certain urban areas. They, also, emphasized that a coherent and properly coordinated artwork-location scheme would provide an entire system of activated spaces in the city, resulting in a integrated network of revitalized areas. Furthermore, pedestrian street prioritization, paths continuity and creation of urban routes that will be stimulating and sensory rich and will link fragmented public spaces is a fundamental objective of urban design (Llewelyn-Davies et al., 2000).

All the above allow the conclusion that media interventions can enhance the intensity of public life, influence the local urban dynamics and, if planned properly, contribute positively to the overall urban landscape by supporting city identity and promoting community feelings.

8.1.2 Effects of Playful and Bodily Experiences with Media Interventions on Space Perception And Human Interaction

A key objective of the study was to investigate how these types of multisensory digital installations affect the way in which people act in and perceive the urban environment. This aligns with the phenomenological appreciation of place and the notion of Pathetecture, as discussed in section 2.1.3, which considers place as a convergence of spatial context, human expression, participation, activity as well as the embodiment of thoughts and feelings.

Various research studies consider performative physical interaction as an inherent feature of digital technology's application in public spaces, provided that the installation's scale allows bodily engagement while also leaving sufficient space for other people to watch the process (Dix et al., 2005; Jacucci and Wagner, 2005; Rico et al., 2010). Furthermore, Stevens (2007) in his research study on public artworks notes that users tend to perform playful engagements with the structures 'transgressive' to behavioral norms such as mimicking, comical expressions, impolite touching or even hitting to explore them physically. He emphasizes that these urban objects placed 'on the stage of urban public space' are used in various social activities, especially in playful activities promoting interaction between strangers.

The studied media interventions, being on the threshold of urban digital installation and public art, provided interesting findings regarding users' **performative play**. Particularly, data analysis explicitly suggests that media interventions managed to act as playful interfaces that promoted performative actions, exploratory behaviour and collective experiences. The design of most of the installations was based on simplicity and creative interaction embracing in this way social and lively atmospheres. Those atmospheres stimulated a number of non-instrumental, informal, experimental and even risky types of behaviour and bodily engagement which primarily characterize the concept of play. Therefore, the studied digital interventions essentially reflect the notion of 'props' or experiential objects, as discussed in section 3.1.3.

The findings from data analysis indicate that the installations, especially Relax n' Release, the Spectrum and Youth Culture, encouraged various forms of performative play due to their form and function, but most importantly due to their form and function. Furthermore, analysis shows that the more people are present at the media environment (around the installation) the more intense and creative the performance is; more playful interactions take place. **Ultimately, what was observed was a reciprocal effect between liveliness, playfulness, bodily engagement and**

sociability. In other words, the more people in the scene, the more playful they tended to be, they engaged more easily bodily with the installations, while being more expressive as well as communicative with others, including strangers. It is important to be noted here that this sort of physical social connectedness and human interaction was further supported by the nature of the interventions which by design they promoted physical interaction rather remote participation.

These observations can be also linked back to previous works on performative interaction and public play. Studies on performative interaction describe triangular relationships that typically occur and stimulate performative interaction (Memarovic et al., 2012), associating it with the presence of 'spectators' and, thus, often related to public space (Tomitsch et al., 2014). Moreover, from the perspective of public play and play events, Stevens (2007) points out that presence of others intensifies and shapes the process of play as other people "can be a source of wonderment and fantasy; they can be the basis for competition and simulation and engender the collective turbulence of vertigo"[5] (p.41). In a similar sense, Lennard and Lennard (1984) note that in the context of public play the common goal is, essentially, to be with, communicate and experience others as a purpose itself.

> *"Play is a basic human need as essential to our well-being.[…] Over time, play deprivation can reveal itself in certain patterns of behavior: We might get cranky, rigid, feel stuck in a rut or feel victimized by life. To benefit most from the rejuvenating benefits of play, we need to incorporate it into our everyday lives, not just wait for that two-week vacation every year"*
>
> *Brown, 2017, para.5*

Performative play can have multiple positive effects on human wellbeing as it allows individuals to develop feelings of contentment, enhances their emotional responses and fosters their interpersonal skills (DCSF, 2008). Furthermore, the emotional connection that is formed between people during play promotes empathy and facilitates more engaged conversations (Leavy, 2009). The incorporation of different types of inputs and perspectives within a state of emotional and bodily engagement can stimulate strong self-reflective processes, which can then be collectively formed and discussed. **In this way, public space that accommodates that performative**

[5] The state of vertigo mainly refers to a variety of behaviours that exceed individual's typical bodily experience and loosen their sense of self-control (Stevens, 2007)

play becomes a spatial setting of creative exchange and experimentation, a site that encourages re-thinking, recreation (Kuppers, 2007) and, thus, representation of current reality and everyday urban experience.

8.1.3 Urban Media Art, Technologically Enhanced Space Perceptions and Everyday Urban Experience

"Art washes away from the soul the dust of everyday life."

Pablo Picasso (in McConkey and McConkey, 2010:62)

Art is an integral feature of the studied urban interventions. Therefore, this section will explore how situated digital art transform and redefines perceptions of urban environment as a mediatized place with multiple encounters. Research findings suggested that urban media art managed to thematize space by infusing it with new activities and experiences and impacted how people related with it, with other people as well as with themselves.

Urban media artworks managed to transform public spaces characterized as everyday spaces or neutral place experience (as described in section 2.3.1) into social environments and/or spaces of meaning and retreat (see section 2.3.1) with more diverse and nuanced experiences. Interestingly, the studied digital interventions provided opportunities to the users to collectively sense and interpret the environment, be more actively involved into public life while also exploring themselves bodily and mentally. The aforementioned manifestations are all related to the fundamental concept of public art.

In this context, the American philosopher Alva Noë (2000) identifies three aspects based on which urban art can be inspiration while also having a powerful visual effect in its surrounding context; a. Urban art should be **lacking clarity to a certain degree**. That means that the artwork cannot be understood and interpreted at a glance but rather it should be gradually explored, b. It should trigger a form of reaction by the audience. Either that is a particular physical engagement, gradual attraction of more and more visitors, initiation of social encounters or just keeping users' attention through dynamic and changing effects, public art should be designed to be engaging or even 'provocative'. C. It should be contextualized and designed as site-specific. For Noë (2000) urban art is not simply enhanced by the surrounding environment but it designed for the location and it is meant to be an integral part of it.

The art installations examined in this study, being digital and most of them interactive, managed to address the aspect of responsiveness by stimulating most of the times multiple effects and reactions by the audience. Moreover, three of the installations incorporated the feature of lack of perspicuity (Youth Culture, Relax n' Release and the Spectrum) however, in the case of Youth Culture, this perceptual complexity seemed not to have always a positive effect as for some user groups the artwork was considered over-complicated and difficult to get. Finally, the aspect of site-specificity was, also, only partially addressed. Although all the digital artworks aimed to create a dialogue with the city and public space and their allocation seemed to respond to the local urban dynamics and spatial characteristics of each sub-space, they can still not be considered as site-specific as they were not designed for the particular environments, but rather as media art installations that can be applied in various urban environments. However, the role of site-specificity in public art is critical as it affects urban space recognition and spatial arrangement of public space dealing directly and thoroughly with the urban context.

The 'site-specific' art is one of many trends set in the second half of the 20th century, however, it has special significance for urban space recognition and spatial arrangement of public places as it deals with urban context (Januchta-Szostak, 2010). From a phenomenological perspective, Norberg-Schultz (1999) notes that the aim of an artwork is to convey certain existential messages while also determining and transforming the character of space where it is located.

The aforementioned interactive artworks are guided, according to their concepts and nature, by the idea that situated media art can cause changes in people's space perception and experience. However, the entire process is held within a field of experimentation where new digital experiences are created and tested both by the designers as well as the users. This form of creative spatial expressions invite people to become co-creators of art and co-experience its various manifestations exchanging roles from observers to creators and participants and, thus, constantly transforming their perceptual landscape and experience. Ultimately, it encourages what Ascott (2007) has called technologically augmented perception/conception" of public space in the sense that digital art is mainly characterized by transformation, interaction and omnipresence. The perceptual transition between the physical space and digitally interactive environment of the artwork through multiple trajectories is also supported by the media artist Rafael Lozano-Hemmer whose works, essentially, symbolize how collective memory related to user's body and urban space (Grammatikopoulou, 2013).

8.1.4 Multifaceted Effects Of Space Personalization and Informality

People tend to actively shape their environment (Twigger-Ross & Uzell, 1996) and, consequently, they can perceive it in multiple ways. Generally, people are more attracted to spaces that can understand and feel a level of attachment to or dependence such as home (Kaplan & Kaplan, 1982). However, the process of shaping the environment, also known as space personalization (or space appropriation), does not take place strictly in the context of home but also in the city level. As noted in section 7.3.3 various behaviours are considered as actions of urban space personalization, such as emergence of unplanned activities around a particular function or object, addition of 'entertaining' elements and improvisation; actions that were all noticed taking place in all public spaces assessed for this study.

But why are these personalization gestures that occurred in space are so important in terms of place experience and what are the cues they reveal regarding individual's perceptual response and social experience? For Thwaites et al. (2013) space personalization and territorial behaviour merges together social and spatial qualities of human existence with their individual and social implications. They emphasize that this form of behaviour is associated with individual's psychological balance as they promote sense of self-esteem and affirmation as people through these mental and bodily actions feel free to implement their own ideas into something tangible in space. Essentially, all of these gestures promote the idea of using urban objects or settings so that they create and re-define human associations with them and their surrounding context. Although personalization refers to a human behaviour with physical manifestations, Graumann (1976) highlights that this process is primarily psychological as individuals are the ones that personalize and appropriate *"not objects.. but objective meanings...and.. not things, but modes of relating to them"* (p. 120). Personalization processes have also been associated with place attachment (Dazkir, 2018) and even with psychological wellbeing (Wells, 2000) as they encourage people to express their emotions and reveal parts of their personality (Scheiberg, 1990). Moreover, it has been found that personalization processes help people deal with stress as they promote feelings of personal control (Edney & Buda, 1976), and generally encourage the creation of spaces more pleasant to inhabit (Carrere & Evans, 1994).

At city level, spaces that are usually overlooked and lack planning, also characterized as leftover spaces or 'urban voids' (Monclús and Díez, 2018) often act as stages for personalization behaviours as they can be creatively transformed into lively informal spaces through the application of such urban gestures and, most importantly, through

the various inventive ways people decide to engage with them (Shaw and Hudson, 2009). This is clearly reflected in the case of the busy circulation node of the waterfront promenade, where the digital installation The Heartbeat was placed, which although being a popular transition point for large numbers of people, in terms of place experience it constitutes a rather human unfriendly space poor in experiential qualities and image. The same applies for the 'awkward' space opposite to it which accommodated the installation Relax n' Release; essentially being a building setback, a widening of the pedestrian route defined by a blank wall with no activity (fig. 8.1-8.3). Both sub-spaces are described by 'temporary absence of attributed function,' (Tonnelat, 2008) and therefore they occur in contrast to the planned spaces of the city where, theoretically, there is provision for activities and identities (Cupers and Miessen, 2002). In this case, the transformative power of the media interventions, not only in terms of the installations themselves but, most importantly, in terms of the personalization activities they triggered, is prominent.

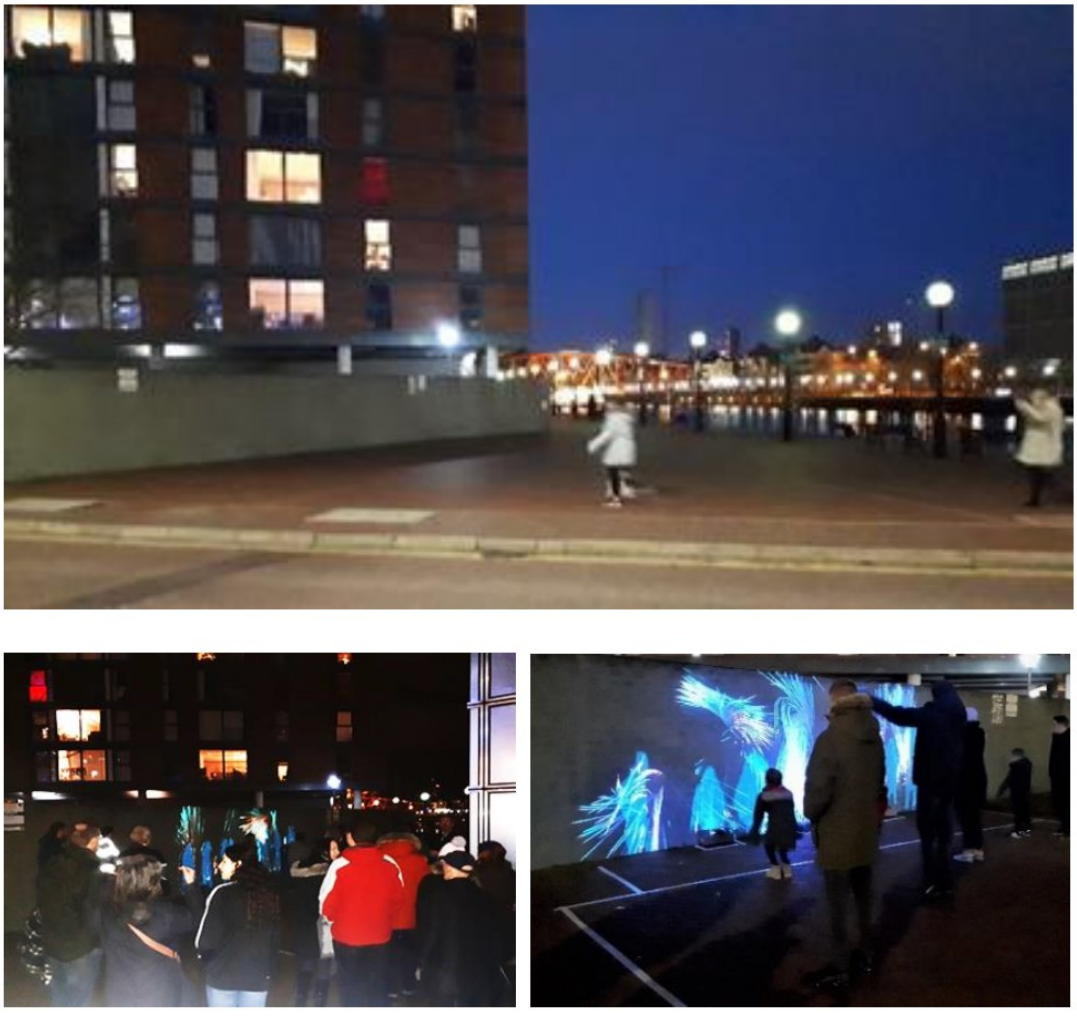


Fig. 8.1- 8.3 The transformative power of a media installation; the same area before (up) and after the implementation of Relax n' Release

> *"For thousands of years, built environments of great richness and complexity arose informally and endured. Knowledge about how to make ordinary environment was ubiquitous , innately manifest in the everyday interactions of builders, patrons and users. Built environment arose from implicit structures based on common understanding."*

Habraken, 1998:2

Although the two aforementioned sub-spaces were clear examples of how space appropriation enabled the facilitation of new informal activities in a former disused or marginal area, research findings suggest that personalization behaviours occurred in all examined media environments manifested through various ways including locomotion, sensory and bodily exploration, manipulation, improvisation and others. On this basis, broadly translated findings indicate that urban media interventions triggering space personalization processes can variously affect human experience in a spatial setting by converting everyday and often empty spaces into places of meaning and attachment.

8.1.5 Affective Contact with Digitally Augmented Space

Data analysis showed multiple implications of media interventions in individual's affective experience in the urban setting. These implications can be mainly categorized into two types of affective properties of digitally augmented public space; a. emotional and imaginative and b. psychologically (and socially) restorative (b1) and therapeutic (b2).

a) Emotional responses and imaginative thinking

Data analysis showed a high range of emotions and feelings deriving from the interaction with the media interventions with most prominent those of excitement, joy as well as feelings of activity. Furthermore, findings suggested a correlation between sensory and bodily exploration of the interactive installations and the various and often intense emotional responses generated as well as the stimulation of feelings of curiosity and imaginative thinking. Emotional responses to stimuli, in this case the digital stimuli, regardless their type (happy, relaxed, active, sad, passive, etc.), highly affect individual's sense of space (Al-Husain et al., 2013).

As noted in section 2.1.6, there is a complex relationship between emotion, mood, place and space and urban media interventions seemed to have a critical impact on the dynamics of this interplay. This confirms previous findings in the literature which have found that the multi-sensory experiences offered by interactive installations

affect human perception of urban spaces (Urbanowicz, K. and Nyka, 2012). Furthermore, Myung and Mi (2017) by measuring emotional responses to digitally augmented architectural and urban contexts found that the introduction of digital media in space develops multiple additional interface functions and greatly 'extends' user's experience and perception in space.

From a socio-psychological perspective, regarding the relationship between imaginative thinking and urban perception, a key role here plays the element of playfulness that has been identified as a main feature of the interaction process, which is in turn associated with the creation of a number of emotions and feelings. In that sense, Lofland (1998) highlights that pleasures in public space can be classified into two fundamental categories; aesthetic and interactional. Aesthetic qualities involve unexpectedness, crowding and simulative fantasy and are associated with sensory stimulation and memories, while interactional pleasure are related to public sociability, people watching and frivolity. As we can see, both types of pleasures can be associated with the concept of play which is triggered by the interactions with urban media installations. Consequently, it can be suggested that the level of aesthetic and interactional qualities of these urban objects as well as the level of human involvement with them can affect affective contact with the environment.

b1)Digitally enhanced space as an urban restorative environment

Data analysis identified an association between the experiential qualities that characterize psychologically restorative environments (sense of being away, feeling of fascination, compatibility) with those found in digitally enhanced spaces. Psychologically restorative environments have gained high popularity lately and, thus, various design strategies have focused on integrating people around natural elements in the city which are traditionally considered as restorative. However, at the same time there is a growing interest in media art and architecture and their contribution in public space experience. Nyka (2006) points out that the simultaneity of these two trends is not coincidental, suggesting also a correlation between naturally and technologically enhanced urban environments on the basis that they are both responsive and seek to enhance urban landscape's quality and experience through the interaction with certain sensory rich elements.

Studies on urban environments augmented by playful technologies have also found that this type of interventions can generally make life in the city and public space more enjoyable, particularly when urban interventions promote collaboration and group work/ play (Nijholt, 2017), while also research on space personalization suggests that

feelings of place attachment deriving from such processes increase the overall individual's psychological satisfaction and mental wellbeing. Moreover, adopting Thwaites's et al. (2013) holistic understanding of restorative environment as a setting that promotes physical, social and mental wellbeing and building upon their idea that there is an inherent social dimension into urban restorative experiences, this study suggests that an engaging and human-friendly digitally enhanced public space can act as an urban restorative environment which offers fruitful experiences and diverse encounters.

b2) Winter blues and therapeutic potential of digital light installations

An interesting finding that derived from data analysis involves the correlation between winter urban experience and, particularly the condition of 'winter blues' and urban media installations. As noted before, the 'winter blues' or Seasonal affective disorder is a form of depression that occurs during the winter months and is mainly caused by the lack of natural light. Northern contexts, such as the United Kingdom, are especially associated with that form of seasonal depression as their residents are exposed to significantly less hours of daylight comparing to southern contexts (Birtwistle & Martin, 1999). A primary course of treatment for SAD is light therapy (or phototherapy) and it involves human's daily exposure to high-intensity and full spectrum artificial light through specially designed boxes (Wirz-Justice, 1998; Kuiper et al., 2013).

At an urban level, in the city of Umeå in Sweden local stakeholders, in an effort to tackle the threats of SAD in individual's and city's mental health, integrated anti-SAD lights into 30 of the city's bus stops. After the light installation the use of buses in the city doubled and the public benefit of urban anti-SAD lights was broadly recognized (Burnham, 2019). Another example of an initiative dealing with winter blues at an urban level, and which is also directly related to the scope of this study, is the digital festival Luminotherapie (Light therapy). Luminotherapie takes place every year in Montreal and, essentially, constitutes a public art event that aims to add 'light, music, and fun to the streets' (Holmes, 2015).

> *"Every year, we are eager to give Montrealers a new creative winter experience. Luminothérapie's public installations transform our relationship with the city, beautify it, and give it a wonderful, friendly touch.* ***Luminothérapie also keeps Montreal shining bright around the world as a hub of interactive art****."*

Rossi in Holmes 2015, para.3

The type of digital light interventions included in Luminotherapie and other digital events (such as Lightwaves) although not necessarily meeting the technical standards of light therapy equipment aim to add light, life and interaction in the often poor winter experience in public space. This beneficial effect was also noted in data analysis, both in the interviews with psychologists as well as in people perceptions during the interviews and on-site discussions.

It is also noteworthy that, besides fighting the stressor of Seasonal Affective Disorder, the therapeutic potential of interactive digital installations has been, also, suggested by Chen et al. (2009) who found that their multisensory interactive installation *Visual Melodies* managed to increase feelings of relaxation and relief and reduce feeling of anxiety in the psychologically stressing environments of healthcare services.

8.2 Implications of Digital Urban Strategies in Public Space Configuration and Placemaking

Urban design and situated media technology are blending into each other. Mitchell (1995:105) stated "Buildings will become computer interfaces and computer interfaces will become buildings.". So, how can strategies for the digital enhancement of public spaces act as a tool for the (re)configuration of public space in contemporary city? This section will explore the ways in which urban media interventions can inspire people to reimagine and reinvent the everyday environments they live in and, essentially, examine their potential to act as placemaking tools. To do this, it will consider the three fundamental placemaking ideas as discussed in section 2.4.1; a. priority to people, b. appreciation of local context, c. adaptability and flexibility of space and proposed solutions.

8.2.1 Digitally Enhanced Public Spaces as Urban Stages for Creativity, Expression and Experimentation

Arguably, the digital element is one of the materials used in architecture that has lately seen an impressive fall of costs as new digital technologies show both a remarkable progress in terms of performance and reduction of their size. Most importantly, they allow non-experts to use them in various ways as their function has become simpler and more robust. As a result, digital features such as sensors, responsive elements, the Internet of Things (IoT)[6] and powerful computing become approachable to large groups of professionals such as architects, designers or media artists allowing the to explore new spatial applications, experiment and build prototypes (Hespanhol et al., 2017). This power of new digital technology inevitably extends the limits of media art and architecture making it a crucial factor in the future of placemaking processes as it allows various novel spatial creative forms and experimental expressions. At the same time, the organic nature and complexity of public space makes it inevitably a great space for experimentation, as it is rather rare to achieve a totally successful intervention from the beginning. Solutions need to be tested and refined over a sufficient period of time (PPS, 2014)

In that sense, a critical theme that emerged from findings is a new approach to public space configuration and placemaking which is now seen as a stage for experimentation and creativity through the design and application of short-term media interventions. From this perspective, temporary digital installations can transform public space into a test bed for innovative applications and potential permanent installations, especially in cases of groundbreaking ideas that would be hardly accepted by decision makers. Digital art festivals are particularly relevant in this field (Arup, 2015). Research findings suggest that media interventions applied in public space for limited period of time encourage the creation of engaging environments which test novel design concepts in real-life and real-time setting while allowing the evaluation of their spatial, social and economic benefits afterwards. Fundamentally, they promote a reiterative approach and a chance to test, process and expand a community's vision before introducing major construction and long term initiatives. As also noted in section 7.1.3, this form of experimental practices have the potential of converting underused and inactive space into exciting laboratories that people can start using immediately witnessing that changes in all public spaces are feasible.

[6] The Internet of things (IoT) refers to a network of interconnected computing devices, mechanical and digital equipment provided with unique identifiers (UIDs) which also has the capacity of data transferring over a network without the need for human-to-human or human-to-computer interaction (Li et al, 2015)

> *"As cities struggle to do more with less and people everywhere cry out for places of meaning and beauty, we have to find fast, creative, profitable ways to capitalize on local ingenuity and turn public spaces into treasured community places."*

Project for Public Spaces, 2011

As McQuire (2008:132) pointed out "experimental practices of contemporary media art can offer a useful test-bed for exploring the critical potential of relational space – the demand to actively construct social relations to others across heterogeneous spatio-temporal regimes – by promoting new forms of public agency". In other words, experimental initiatives of media art and architecture can dynamically redefine socio-contextual relationships between people and public space across various spatial contexts and periods of time. Furthermore, Urbanowicz and Nyka (2016a) emphasize that several experiments of new media art and urban interactive installations have proved to be rather successful in terms of public life revitalization. Most importantly, experimental digital interventions allow citizens to join discussions on urban space and get involved into its rearrangement through their participation into pilot projects. Their participation can be reflected either on their knowledge and insight contribution regarding the places they live in or their actual involvement into the experimental space reconfiguration process through physical amendments. These approaches can give new meanings to public engagement opening new channels for participation characterized by equality and creativity (ibid).

Indeed, data analysis confirms that all digital installations studied, especially the interactive ones, were characterized by a high level of creativity, not only in the sense that were media artworks but, most importantly, because they prioritized active, inventive and various ways of human engagement with them. The site area, by facilitating different design vocabularies and ways of conception and expression, managed to trigger diverse transformative actions, encourage emotions and perceptions from people and finally promote social reflexivity and connection. Furthermore, the element of performative play is an inherent element of such installations as seen in section 8.1.2 is directly associated with creativity, both of the designer as well as the user. In this respect, as O'Shea (2012) notes, users by exploring the complex performative features of a socially situated bodily experience they gradually develop new ideas for transformational changes in themselves and surrounding context.

From the perspective of public art, Rewers (2013) notes that community art, site specific art and digital art have developed into the most prevalent and creative practices for public space animation. The studied interventions, although not being totally site specific can be considered as a form of community art as they all aimed to create responsive landscapes in public space by engaging citizens into social and imaginative activities which can, consequently, keep community momentum strong develop new memories of public space. These newly created memories can be related to past situations and form something that Rewers (2013) calls 'nostalgic memory'. In this way short-term media art and architecture strategies can influence perceptions of public spaces long-term and form the foundations for their future creative and engaging transformations (Urbanowicz and Nyka, 2016b).

8.2.2 Adaptability and Human-Centered Design: Digital strategies as a form of tactical urbanism

As noted in section 2.4.2, various communities are lately implementing flexible short-term adaptations in urban space aiming to animate public realm and make it more inclusive and human-friendly. **These bottom-up and low scale adaptations, also referred to as tactical urbanism**, can subsequently inform broader planning strategies while also encouraging cities to apply quick, iterative adjustments that encourage community involvement and empower community feelings (Abd Elrahman, 2016). As discussed in the previous section, **urban media interventions often having a temporary character and also having witnessed a significant drop in the cost of their digital features, offer a great test-bed for short-term public space adaptations as they have the potential to contextually relate to their surrounding space and people and at the same time be inviting for the citizens.** Furthermore, as Urbanowicz and Nyka (2016b) point out that urban interactive installations having the ability to be flexible and movable they can be applied to and tested in various locations as pilot projects that can reveal the assets of different areas or public spaces. Moreover, as Świeżewska (2011) suggests, this type of urban interventions and digital adaptations can attract newcomers and, therefore, trigger the introduction of new assets in these particular areas. The aforementioned benefits all align with the logic of tactical urbanism and thus the analysis of the studied urban installations for this research showed several overlapping characteristics with tactical placemaking projects.

"In the last 50 years, architects have forgotten what a good human scale is."

Jan Gehl in Alonso (2017: pa 1)

Besides their adaptive potential, another key characteristic of urban media interventions, as discussed in section 8.1.2, is their ability to restore human scale in an urban environment, which is also a fundamental goal of placemaking. Being human-led and community-led strategy, placemaking is based on gradual and context-sensitive changes and therefore it is considered as a process rather than an outcome (PPS, 2016). Correspondingly, data analysis indicates that the very effect of the digital projects does not rely solely on the implementation of the urban installation themselves but on the fact that they managed to introduce new activities and behaviours in all targeted urban areas.

In the same context, Urbanowicz and Nyka (2016b) characterize such digital urban interventions as 'micro-interventions' with a twofold role; from an architectural perspective, they can be regarded as urban built structures but at the same time they are complex systems with responsive features able to attract people, let them gather in a certain space in the city to interact with them and enjoy their play and socialization**. In this sense, urban media installations can be considered as substantially human centered interventions as they can manage to restore human scale not only at a spatio-physical level in open space but also at a community level.**

'…We challenge sweeping reforms that do not acknowledge or accommodate local contexts. There is no one human scale, but by engaging in a placemaking process, we can find the scale that works for every community.'

Stephen Burke, PPS (2016, para.13)

Generally, research findings confirm that, as tactical urban projects, the studied digital interventions managed to address the inadequacy of the built environment and public space to a significant extent, providing for area's residents as well as visitors. Apparently, such tactical digital strategies, being temporary and small-scale cannot solve all issues an area faces. For example, the Plaza which constitutes a large and central civic public square dealing with various issues such as lack of enclosure, human scale and space articulation as well as lack of pedestrian activity and diversity of uses was impossible to be completely transformed both physically as well as perceptually through the application of a small or medium scale digital intervention

like Youth Culture. **That led to the realization that the scale of the intervention needs to be equivalent to the scale of public space, only physically but also in terms of the level of existing challenges.**

In this sense, it can be argued that media art and architecture interventions and generally digital placemaking projects that prioritize human engagement and experiential qualities **can be regarded as a new form of tactical placemaking as they build upon its logic while enriching it with more possibilities deriving from digital technology and interaction design.** However, their technological robustness and sophistication it terms of materials and design, despite the drop of prices in electronic features, inevitably makes this advanced approach more costly as well.

8.2.3 Challenges

Despite the potential of urban media art and architecture projects for the revival of public space and enhancement of its total experiential qualities, research findings suggest also some crucial challenges that these projects face both in terms of the installations themselves as well as broad digital strategies in the city. **Following the overarching conceptual framework, the challenges have been classified as contextual, social and perceptual referring to dimensions of place experience as well as process-related challenges referring to strategy's feasibility and relationship with placemaking.**

One of the most critical **contextual challenges** notes by digital event's participants, staff and curators was that of weather. Cold weather conditions had as a result a less pleasant feeling of staying outdoors and engage with the installations and even more demanding for event workers to supervise the pieces for more than 4 hours. However, as discussed previously one of the main objectives and outcomes of the event was to activate and repopulate public spaces during these very conditions, so from that perspective this aspect can also be considered as a strength. Another important challenge that emerged from findings was that of *contextualization*. Urban digital installations, being sometimes drastic interventions for the urban grain and architecture, need to take into consideration and create dialogue with adjacent structures not only physically but also in terms of their use and user profile. In addition, as seen in data analysis the allocation of the media installation need to take on board the major viewing perspectives as well as the spatial arrangement of the interaction areas. Regarding piece's contextual integration, Halskov and Ebsen (2013) also emphasize on the significance of the content of the installation that needs to fit in the

scale, shape and light quality of the surrounding environment, while Dalsgaard and Halskov (2010) highlight the importance of 'situational circumstances' that may emerge at the same time in the area.

In terms of the challenges concerning **the social dimension of experience** with media interventions, the aspect identified through data analysis was the fact that in some cases the level of age mix in some areas was not very advantageous for young people. So, as for example noted in section 6.4.3, although Spectrum was an attractive installation for all age and user groups, the area was often so busy with kids interacting with the artwork that made it in some case less appealing to young people who would rather share the interactive experience with users more close to their age. In this sense, Dalsgaard et al. (2016) point out that as urban media interventions are implemented into urban settings that accommodate a great variety of people and activities they are capable of disrupting and transforming existing social relations and balance and create new ones. It is very crucial that the newly transformed social relationships are more successful and beneficial for public space and its people than the previous ones.

Regarding the **perceptual and conceptual challenges** of the interventions, the most critical challenge that findings suggest is that installation's design and performance needs to maintain a balance between being intriguing and complex in a creative way that triggers a sense of exploration and being overly complex and sophisticated, or in other words a 'difficult to get' interactive system. This balance is rather important because, as seen in previous sections, relatively complex interaction layouts that can be explored gradually, as in the case of Relax n' Release stimulate user's creativity, curiosity and make them stay longer, whereas simple and 'straight forward' installations like the Heartbeat although attracting large numbers of visitors to try them 'on the spot' do not manage to keep them interacting for long. On the other hand, artworks greatly sophisticated combining also highly advanced digital technologies with multiple functions and messages that cannot be interpreted easily (like Youth Culture) turned out to feel less engaging for some people. However, even in these cases people found ways to personalize the installation and customize their experience by giving new use and meaning to the installation.

The process related challenges of the urban media interventions mainly refer to the broad urban initiative of a digital event which involve multiple installations rather than the installations separately. Essentially, the issue that emerged through findings is the reciprocal challenge of tight budget and need for robustness of materials and structures. In other words, as this type of digital art festivals are free and community based with primary economic sources related to partnerships and collaborations, their

respective budgets are inevitably pressured. At the same time, urban media installations require a high level of material robustness and novelty for two main reasons; a. in order to successfully feature digital technology elements and usually incorporate interactive systems into physical structures of art or architecture and b. to ensure the durability of the installations as they are often exposed to tough weather conditions. This sort of reciprocal issue requires from curators and designers to be creative and innovative in order to maximize the potential of available funds. In a similar sense, Dalsgaard et al. (2016) note that another challenge for media architecture projects is that these structures, being located in the urban setting and public spaces, are more vulnerable to vandalism and thus, designers need to implement strategies to respond to these threats.

8.3 Design and Planning Considerations for Urban Media Interventions

As seen in previous sections, the links between all the factors that affect human experience in digitally augmented spaces are complex as none of those adheres to a simple cause and effect relationship. Urban space and its people act as living organisms and, thus, all aspects that may affect their performance are dynamic and interconnected. However, it is possible to consider some major design and planning issues which are likely to have substantial impact on place experience and placemaking process when designing and planning urban media interventions.

First, a fundamental pre-condition for the success of a digital installation in an urban environment is its contextual integration. **The architectural relevance and, most importantly, the urban relevance referring to the extent to which the digital installation blends with the existing physical context and form of public space in terms, for example, of urban form and rhythm, environmental colour and light, open space scale and building proportionality can greatly affect intervention's success and pervasiveness**. A great example of such integration was the case of Relax n' Release which was not only completely integrated into an existing structure but it successfully fitted in the wider context of its location in terms of scale and proportion. In this sense, Behrens et al. (2013) point out that contextual factors such as location and spatial configuration can highly influence people's performative interaction with media art and architecture artefacts and thus, should be taking into consideration when designing urban media environments. From the perspective of (urban) art, and as noted in section 8.1.3 an urban media art installation as a form of public art should be site-specific and designed for the particular context

in order to ensure its inspirational quality and visual effect (Noë, 2000). However, findings indicate that even if the media artwork is not designed for the exact location, yet it takes into consideration primary principles of public space and the wider context and if, most critically, it is allocated in a compatible location, it can still convey its messages, create urban identities, engage people in multiple ways , stimulate activity and generally achieve its full potential.

The study also demonstrates a correlation between the level and type of responsiveness of a digital intervention and its corporeal and conceptual qualities in the overall experience with the piece. In other words, complex and dynamic effects that are explored gradually, multisensory stimulation, full bodily engagement and ability of the installation to dynamically adapt itself to changing audiences are critical factors that determine the level of human engagement with an installation in an urban setting. This can be also related to the concept of *multimodality* or "the use of several semiotic modes in the design of a semiotic product or event" (Kress & Van Leeuwen 2001: 20). This concept dates back to the 1920s, representing a technical term in the then relatively new field of the *psychology of perception* (Van Leeuven, 2011). Kress and Van Leeuwen (1996 [2006]) and O' Toole (1994 [2010]) established the foundations for multimodal research in the 1980s and 1990s, drawing upon Halliday's (1978, 1985, 1993) social semiotic dimension of language *to explore the meaning potential of images, words and sounds as sets of interlinked structures*. Kress and Van Leeuwen (2006) examined images and visual design, while O' Toole (1994) applied Halliday's systematic functional approach to a semiotic evaluation of displayed art, sculpture and architecture. In the field of media installations Stojšić (2017: 145) uses the term multimodality to refer to the ability of a digital *installation 'to address multiple human sensory systems'*.

In the field of this study, **this complexity can be reflected on visual transformations that are unpredictable, more personalized and intellectually or bodily challenging which do not involve a sole predetermined function and offer space for creative interpretation**. Concerning the installation's form and materiality it is also critical to allow personalization and improvisation so people, regardless their perception of its digital performance, can approach it and engage with it physically. Data also suggests that the dynamic experience of an urban media installation although engaging should not overly emphasize on the digital technology or the features of the installation itself, but it should rather be perceived as subtle, trying to enhance the existing the spatial and social qualities of public space. This is

also confirmed by the findings of Houben et al. (2017) on their study regarding the *meaningful integration of media in architecture*.

Furthermore, data analysis indicates that for an urban digital initiative (like a digital art event) to be inclusive and encourage user diversity should be comprised of a network of media installations that incorporate different scales, functions and forms of interaction in order to respond to all various physical and mental abilities. At level of a single installation, as noted before, multifold concepts and multiple responses are key aspects that encourage attraction of wide user groups.
As for the sites that are programmed to facilitate digital interactive installations, thoughtful planning is required so that the space around the installations (both play zone and observation zone) will be inviting and responsive to the forms of interactions and activities they may generate. Flexible urban furniture, temporary lights, speakers and sensors could enhance experience in digitally augmented public space even more by developing the opportunities these technological artefacts offer for the benefit of public realm and life. Finally, comprehensive programming and financial planning as well as curatorial initiative are crucial to ensure the consistency of the urban digital practices, the diversity of communities and people involved in the making and experiencing of urban media interventions and the achievement of the long-term effects of public space's digital augmentation.

The aforementioned factors should be taken into account when considering how to design and program for media interventions in the city as they can increase their spatial and social adaptation, wide the range of activities they create and optimize perceptual experience with them and space that facilitates them. An awareness of these parameters would be valuable to media artists, architects, urban designers and planners as well as event curators and stakeholders when designing an urban media installation or scheme to enrich design possibilities.

CHAPTER 9

Conclusions

This study explored how the various interrelated dimensions of place experience in public space can be affected by the application of media interventions as well as their potential as tools for placemaking. This multiple embedded case study aimed to examine the diverse applications of urban media art and architecture in different public space typologies in order to examine and evaluate the multiple ways in which these projects can (re)create and transform urban space and, most importantly, human experience, behaviour and activity in it.

This chapter provides a review of the research results, main contributions of the study and directions for future research work. Particularly, the first section presents a summary of research findings in relation to previous research on this topic. The second section discusses the significance of the research while the third and fourth part of the chapter explore the implications of findings and contribution to urban design theory and methodology respectively. The fifth section sets the limitations of the study and, finally, the chapter ends with recommendations for future research.

9.1 Summary of Findings

9.1.1 A new experiential approach to urban media interventions

Places can influence human behaviour and activity through the provision of spatial, social, emotional and cognitive stimuli. The effect of physical space on human experience has long been recognized as well as its relation to the degree of human performance and human needs satisfaction (Ergan et al., 2018). Literature review on place, human experience and public space revealed three fundamental insights: i) Place and consequently place experience in urban space is a highly complex concept comprised by several features that need to be examined and evaluated through different perspectives in order to develop a deep and comprehensive understanding of them. Furthermore, several patterns were identified among all different fields of inquiry and theoretical approaches regarding the interpretation of the concepts of place and place experience. These patterns mainly involve the physical, contextual, social and perceptual dimensions of place and, most importantly, the belief that these qualities are greatly interdependent. ii) Designing urban environments rich in experiential qualities with distinct identity is crucial for contemporary cities due to the several challenges that public spaces are undergoing lately. iii) Public space can act as a setting for innovative transformations with critical effects on human everyday lives facilitating multiple opportunities for creative actions and citizen participation. In this context, it is suggested that placemaking projects are able to support positive place experiences both at a personal and community level through the development of spaces that add a new layer of activity in the city.

As the main topic of the study is media architecture and urban media installations, the key finding of the literature review involves the development of a new classification regarding digital interventions in public space. *This new approach is fundamentally based on the belief that the effect of digital interventions in the city reaches beyond their physical manifestation in public space, incorporating broader social, affective and perceptual qualities*. Indeed, the analysis of the major media art and architecture typologies according to the scholarship revealed the fact that these artefacts can be classified in two major types: a. spatial structures that incorporate the digital element as *a new construction material* primarily evoking its image-changing potential (prioritizing their technical and functional features) and b. physical installations that incorporate digital

technologies in order to act as urban experiential mediums (prioritizing human engagement with them).

Having recognized the importance of people's engagement with places and the respective experience of them the study highlighted how digital interventions impact on public space's character, perception and conception and in turn why such media deployments need to benefit from urban, spatial and architectural knowledge pursuing a holistic placemaking approach.

9.1.2 The need for a pragmatic approach

Based on the fundamental theoretical framework of the study it has been realized that the idea of place and urban experience should be considered in much broader terms than the analysis of general spatial configuration and the physical characteristics of buildings and street structures in a certain context in respect of human dynamics. With the notion of place experience being closely related to social, psychological, cultural and conceptual qualities of space, the study identified the need for the creation of a more holistic and comprehensive framework for the evaluation of urban media installations concerning their experiential quality. *It was found that human experience in public space is a multifaceted concept that incorporates the reciprocal and dynamic transaction between humans and their physical and social setting and it can be constantly transformed through the addition of new environmental stimuli*.

Therefore, this research took the stance that human experience in digitally enhanced urban environments could be evaluated through its level of spatial and contextual response, aspects related to social activity and integration as well as a number of perceptual and affective indicators. In light of this, *a pragmatic approach was required in order to gain a rich understanding of the potential of digital technology's integration into the built environment not purely focusing on its visual and functional impact*. This mixed methods study conceptualized integrated research in the theoretical and empirical context of the city and its users in order to explore the multiple processes of designing, developing and primarily engaging with media installations in public space.

9.1.3 Place experience in digitally enhanced urban environments

Study's findings suggest that certain types of urban media interventions can enrich and deepen the relationship between people and places in multiple ways. These are the media art or architecture installations that actively incorporate human engagement with them, through digital or physical interaction, fundamentally changing experience in urban spaces. Ultimately, digitally enhanced public spaces can reflect and promote space vibrancy, public engagement, social interaction and significant physical transformations; factors that all contribute to the redefinition and activation of our everyday urban environments.

a) Context

Research findings inferred that media art and architecture installations when placed in public space are able to affect the overall socio-spatial context and develop a setting that is at the same time collective and responsive, creating place experiences that actively adapt to changing needs and activities of the space they mediate.

Particularly, that the implementation of new digital environmental stimuli played a critical role in the redefinition of the everyday urban experience of the users who were then allowed to dynamically engage with art and architectural artefacts and, in this way, became parts of an informal public happening. Furthermore, by getting engaged with object embedded into the architectural space of the city, users consequently got more engaged with the urban environment. Besides the important implications in terms of the physical transformation and articulation of space through the application of the new digital artworks, the most critical contextual effect that emerged from findings is that this type of interventions not only attracted large numbers of users to engage with them but, most importantly, they stimulated a number of spontaneous subsequent activities and expressions that, ultimately, attracted even more people. In this respect, the study highlighted that digital technology in the form of urban media interventions acted as an initial driver to activate space, followed by a second more powerful stage of activation that derived directly from the redefinition of the local human dynamics.

b) Social

This research suggests that the social effects of the application of interactive digital installations in public space are multiple. From a broad perspective, research findings showed that urban media installations managed to enhance social inclusion and diversity in all studied public spaces by promoting a considerably higher mix in human population during their presence comparing to the area's demographics without them.

Furthermore, the study highlights that this type of digital installations offered great possibilities for interaction in public space. This finding confirms Seitinger et al.'s (2009) conclusion that urban media installations when placed in highly public environments, such as urban public space, create novel and pervasive interaction opportunities. Particularly, the study found that regardless the level of familiarity with technology or digital installations, the users were curious and willing to engage with them and this form of engagement triggered further interaction between them. The finding also corresponds with much of the other literature on urban media installations and especially on their ability to initiate human communication and serve as 'ice-breakers' (Gehring, 2013, Balestrini et al., 2016). Furthermore, the study discovered that bodily engagement with installations played a critical role in exploiting their full potential in terms of human connectedness and interaction. Embodied engagement and performative play with the media interventions encouraged exploratory behavior, expressive gestures and collective spirit among the users. This overlaps with Lennard and Lennard's (1984) perception that the fundamental purpose of public play is to communicate experience with other people. Ultimately, research findings point out that deployment of interactive digital installations in public space trigger a reciprocal effect of vibrancy, playfulness, embodied engagement and higher level of sociability between users.

c) Perceptual

Research findings indicate that urban interactive installations can form a new type of creative spatial expression that encourage city users to become co-creators of art and urban objects, experiencing collectively their multiple manifestations. The process of experience involves users exchanging roles from passers-by to observers and active creators/ players which results in constant transformations in their perceptual response in their surrounding context.

From a psychological perspective, study's findings suggest that urban media installations with strong experiential quality which encourage playful experiences can have several

implications in people's emotional and social wellbeing as they can positively affect human imagination and creativity, develop feelings of happiness and contentment and their promote interpersonal skills by making them more sociable and open to new encounters. Essentially, this was directly reflected on their relationship with surrounding public space and affective response to it as the findings showed a considerably higher engagement between users and urban space during the presence of the installations. Therefore, although certain variations were observed between the feelings created during the interaction with each installation (some installations influenced more the hedonic tone of the users while others mostly affected their energetic arousal), the overall perceptual experience of space and affective contact with it during the period of its digital augmentation was improved.

Furthermore, study showed that urban media interventions provided great opportunities for space personalization, appropriation, several manifestations of territorial behavior, bodily engagement and self-expression which, in turn, are all related to feelings of place attachment, sense of familiarity, self-determination and safety.

d) Overall

The integrated approach of this study ultimately identified the main features of human experience through the interaction with urban media intervention in public space from a spatio-contextual, social and perceptual perspective. Overall, this research found that urban digital installations can play an integral role in the improvement and enrichment of place experience in public space when they are treated as devices that aim to promote human engagement, self-expression, creativity and delight through people's participation and experimentation. The fundamental challenge in the creative application of urban media technologies is to develop a comprehensive strategy that aim to articulate public space through the design, planning and deployment of interventions that respond to the existing physical and social context, understand space's human dynamics and promote its main assets; essentially, by integrating the existing urban physical space with critical features of human behaviour and performance at the particular context and the interactive digital environment created by the media interventions.

9.1.4 Urban media interventions as tool for placemaking

Cities like living organisms are constantly changing and being redefined through actions of urban transformation and renewal that aim to respond to their new requirements. This study explored digitally augmented urban space as a platform for placemaking, investigating the role of creative and engaging media installations as a significant tool in shaping new activities and experiences in the city and, especially, in public space. As seen in section 2.2.1 public space can act as the essential dynamic complement to the more passive and settled everyday experience, providing opportunities for new urban flows, social interactions, formal and informal encounters as well as a setting for relaxation and play (Carr, 1992). Getting detached from these fundamental qualities, contemporary public spaces are becoming what was described in section 2.2.1 *spaces of weak place experience or "placeless"*; meaning that although they are not associated with completely negative effects of physical deterioration, antisocial behavior and crime they suffer from the lack of stimulating and pleasant experiences, vibrant human activity and social interaction; essentially the lack of positive place experience.

While urban planning strategies are generally long and formal top down processes aiming to assess and balance out multiple aspects at social, financial, spatial, institutional and environmental levels of the city, placemaking practices prioritize the human factor through the provision of spaces that promote active and engaging urban environments. *Research findings suggest that although not constituting a radically new placemaking type by principle, urban media strategies serve the main ideas of placemaking having the ability to augment its conventional practices by primarily relating to the principles of tactical and creative placemaking. Therefore, it can be argued that media art and architecture projects can act as a supporting tool in placemaking and urban renewal processes.* As discussed in section 2.4.1 the three core qualities of placemaking are: a. emphasis on human factor, appreciation of the local context and c. flexible and adaptable design of spaces.

This study, by scope, has focused on the investigation of urban media installations that act as experiential objects, or *digital props* (refer to section 3.1.3). This type of digital installations are mainly designed to generate awareness of the surrounding environment and foster people's engagement with it. The research showed that these urban media interventions offered users the opportunity to reinvent and rediscover their everyday

spaces while also allowing creative and light spatial expressions to occur. This had as a result public space to be seen as a stage for experimentation, flexible adaptation and playful performance being converted from an underused inactive space to a vibrant outdoor laboratory of media art and architecture. In this sense, the flexible creative adaptations of space as well as the playful engagement of users with art played a critical role in clarifying *how emergent media technologies deployed in public realm in a context sensitive way can assist the process of placemaking by serving its three core ideas as noted above.* Furthermore, as discussed in section 2.4.2, the active participation of citizens encourages new forms of tactical and adaptive urbanism to occur empowering them to reclaim their urban spaces through the design and deployment of short term, self-produced and low budget interventions. In this context, this study's findings indicate that the involvement of citizens and professionals from various fields, rather than planners exclusively, in the creation of digital types of tactical urbanism can enhance media art's and architecture's contribution in the enhancement of place experiences in the city.

Especially the concept of designing playful experiences as a tool for urban transformation aligns with Borja-Villel et al.'s (2014) approach who consider urban space as a playground and play as a integral part of urban revitalization processes. It is also in line with the Innocent's (2016) notion of playful citizen who regards the city as a space for opportunities to encounter, explore, form and create new cultural and creative occasions.

9.1.5 Design considerations for successful urban media environments

The dynamic and versatile nature of urban space makes it a rather complex setting to establish normative considerations for any type of intervention it accommodates. However, the study found some fundamental aspects that should be considered when designing and planning for the digital augmentation of a public space.

Context, compatibility and architectural relevance

The study found that in order to achieve architectural relevance and a high level of into the existing urban space, the design and application of dynamic media should consider a number of physical qualities of the built environment. Particularly, the form and location of the urban media installation should take into consideration and be compatible with public space's scale, proportionality, layout, critical viewpoints and, fundamentally, the predominant ambient colour and light level. These parameters that relate with the

physicality of the installation mainly consider how it blends in the overall architectural urban expression being able, at the same time, to be identified from the users and attract them. Ultimately, research findings highlight the significance of the evaluation of media interventions in the city through the lens of architecture and urban design by examining the level of their architectural integration, the compatibility of their content and function according to adjacent urban activities and the overall physical effects and dialogue with their surroundings.

Human activity and Urban dynamics

Closely related to the concept of spatial integration and compatibility with the surrounding context, research findings suggest that one of the most significant parameters that designers and planners of urban media interventions should take into consideration is the local human activity and urban dynamics. This ultimately involves qualitative and quantitative aspects related to people using the public space before its digital augmentation. In other words, urban media installations should take into account and respond to the existing user groups, population, human flows and user behaviour in order to address any issues related to lack of human activity.

Social context and inclusion

The study also infers that an urban media installation or set of installations in the form of an urban digital initiative is crucial to be inclusive and promote user diversity. In order to achieve this, media installations should involve different scales, functions and types of engagement in order to respond to various age groups, user backgrounds as well as physical and mental abilities.

Engagement and user experience with installation

In terms of aspects related to successful human engagement with the media installation and perceptual response to space through user's interaction with it, the findings highlight the significance for the provision for *multimodality*. This refers to the ability of the digital installation to facilitate multiple and complex features in order to provide dynamic and ideally multisensory effects that are able to be explored gradually and differently according to the user. This feature is critical for two reasons:

a. it stimulates users' creativity and imagination through its progressive exploration increasing the duration of engagement with it and, subsequently, with the spatial context it is located into and

b. it promotes installation's inclusivity as it makes it able to attract and respond to multiple user groups.

Design and Planning Process

In order to achieve a high level of contextual integration and human engagement, research findings suggest that it is critical multiple actors to be involved the process of design, planning and deployment of urban media interventions. These actors involve local stakeholders, design experts as well as citizens being engaged in a process of participatory design that empowers the whole community to collaboratively design and curate interventions' content. It is also rather critical for media designers and architects and HCI experts to share their knowledge in digital technologies, design, interactivity and user experience in order for a successful symbiosis between architecture, urban design and digital media to be achieved.

Furthermore, this study proposes that research should promote ways in which architects and built environment designers will become aware of the benefits as well as opportunities and challenges of integrating digital media in an existing urban context. Such procedure of awareness should include successful but also less strong examples in order to ensure that the final outcome of the design will proactively consider the effects of its potential presence in the urban environment.

9.2 Significance of the research

This study is significant and topical due the emergence of media art and architecture and generally due to the increase of the application of urban digital initiatives around the world, which often replicate designs without consideration of the human factor and the local context having, consequently, weak response to place qualities. Yet, at the same time, media art and architecture disciplines are now considered fields for the most creative experimentations of situated digital technologies (Gasparini, 2013). These disciplines are growing since architects, urban designers and planners gradually are also realizing the importance of the practices in terms of the transformation and enhancement

of human experience in the built environment. Therefore, built environment professionals need to understand how urban media technologies can be used to improve the quality of people's engagement with the urban context. Bridging the gap between urban design practice, placemaking strategies, multidisciplinary human experience approaches and digital science this study forms a crucial contribution to the analysis and evaluation of digitally enhanced urban environments from a human-centered perspective having built new knowledge around the tactics of urban media interventions and digital placemaking.

It was vital and urgent to develop an integrated approach for the evaluation of digitally augmented public spaces as media art and architecture have long been recognized as practices that cause versatile effects in the cities, engaging qualities that range from human interaction, citizen participation, social awareness as well as visual and physical transformation (Dalsgaard and Fritsch, 2008; Sparacino et al., 2000).

Furthermore, in the context of United Kingdom light and digital art festivals that seek to activate public spaces through the application of digital technologies are getting more and more popular, especially in winter time in the northern part of the country. Last year (2019) alone more than 10 UK cities such as London, Manchester, Liverpool and Bristol facilitated light and media art events showing their interest to actively take citizens out of their houses offering them opportunities for new dynamic urban experiences. It is anticipated that the research findings will be valuable for stakeholders and the local authorities in developing systematic guidelines, as well as for architects, designers, event curators and planners in developing urban media initiatives in the future.

9.3 Implications of findings

Studies have addressed how urban digital installations can impact on social interaction in public space, promote public engagement and act as a medium for message communication in the urban context, however, there appears to be a lack of comprehensive research that seeks to achieve a balance in the evaluation of all potential affordances of digital media in terms of place experience in a particular setting. This research provided insight into the aspects and influences that affect the success of a network of urban media interventions in terms of its contextual integration as well as its social impact and perceptual response. The findings of the study have particular implications for urban design, planning and architecture implementation concerning

regarding digital augmentation of public spaces in several contexts. It has been discussed with respect to the context of MediaCity (Manchester) but it can also have implications for other urban centers within the same country or even different countries with similar contextual qualities. The four major implications are:

a) Integrated academic research and comprehensive evaluation of digitally enhanced urban environments

The tools employed in this research and its integrated methodology could be adopted and adjusted by researchers, urban designers and architects in both academic research and in post-application evaluation of digitally augmented urban environments. Some researchers have begun to explore holistic ways for the evaluation of human experience in urban settings (eg. Ellard and Montgomery, 2013; Happier By Design,2017, Happy City, 2018), however there are no such studies in the context of media architecture and digitally enhanced public space regardless their considerable increase in the last decade. This study can throw light on the complex relationship between media environments, public space and human experience at an individual (perceptual) as well as at a community (social) level.

b) Designers and event curators

The proposed conceptual and methodological framework enables both media designers and digital art event curators to employ it either as a design and development tool or an evaluative model to study the effect of an applied digital strategy. For the design of new media installations, the conceptual framework illustrates the versatile aspects and stages experience from different perspectives. A media designer can take into consideration each of those parameters and try to optimize the effect of the designed installation based on the main influential qualities.

c) Update of placemaking and urban renewal processes

Research findings may be particularly important for the future of urban creative interventions as they may affect the way the policies, design solutions and revitalization schemes are implemented. That is because the studied network of urban digital interventions can be associated with urban renewal and placemaking practices that are focused on activating selected underused or neglected urban areas through the application of light and quick solutions. The medium and, even, in some cases, small

scale media interventions that aim at the creation of new meeting points and vibrant activities encouraging citizens congregate and play align with the objectives of most of the contemporary urban renewal and placemaking processes. Despite their limited size, the study showed that such digital projects manage to activate public spaces successfully by attracting high numbers of users, making users stay longer and, fundamentally, by applying less invasive and more sustainable ways comparing to traditional urban transformation practices. Delivering new images and identities as well as shared experiences and memories, urban media interventions have the power to add new values to city spaces and effectively enhance the character of contemporary cities.

d) Need for awareness and integrated collaborations between decision makers and informed planning frameworks

The findings from this study revealed the need to increase awareness regarding the significance of human-centered and contextually relevant digitally augmented urban spaces. This is crucial for more people friendly and vibrant public spaces in the era of digitization informing traditional and, in some cases, outdated planning frameworks. The importance of it encompasses the advantage of the creation of more active and versatile public spaces, the enhanced urban experience and, consequently, the improved state of psychological and social wellbeing in the city. Although much effort has been done before to increase the awareness of the introduction of the digital element in different aspects of the city and contemporary urban life, there is the need to increase awareness regarding its potential as a tool for creative urban transformations aiming to prioritize public engagement and integrated collaborations between the community, stakeholders, planners and designers. Problems such as light pollution, over-scaled or incompatible with the surrounding space advertising screens and irrelevant content and function in media architecture artefacts may be avoided if there is increased awareness and coordination between the multiple parts involved. Since planning frameworks in most countries do not involve sufficient guidelines and considerations regarding the design allocation of digital elements in the city, more in-depth synergy is required between media artists, light designers, built environment professionals and decision makers at all levels for the development of urban projects that can use situated media technology as a tool for making better, more friendly and attractive cities.

9.4 Contributions to Knowledge and Urban Design Frameworks

The reason for conducting this research is to put forward an informed debate and set of findings that pertain to the urban design issues of the core phenomena of Urban Media Interventions. As noted in section 3.5, the main gap identified and discussed in this study is related to the lack of comprehensive and holistic research regarding the study of digitally augmented public spaces as places for new and transformative urban experiences. In an effort to fill this gap, this study has provided theoretical, methodological as well as practical contributions to knowledge and urban design frameworks.

Theoretical

Contribution to urban design theoretical frameworks

The purpose of this study is to develop a theoretical framework for the creation and evaluation of place experiences within digitally augmented urban environments. Place Experience is not an innovative concept in the field of urban design. Several scholars and urban design frameworks have emphasised the significance of creating urban environments that provide rich and versatile experiences. **However, this study attempts to bring a fresh perspective to existing urban design frameworks and, essentially update them by integrating knowledge related to the emergent practices of media architecture and urban media art.**

Media art and architecture are relatively new fields of research and particularly recent in the context of inquiry related to urban design, cities and placemaking. Consequently, this study building upon the concept of place and human experience can essentially inform fundamental place-based and people-centred urban design theories. Therefore, the present study having explored the integrated effects of urban media installations in regards to the transformation of urban space as well as human experience provided some critical theoretical contributions to knowledge both through its literature review but, most importantly, through its primary research.

Study's main theoretical contribution has been the reveal and assessment of a number of contextual, social and perceptual affordances of the application of urban media interventions in a particular set of public spaces. **The study fundamentally reflected on the various dimensions of place experience as formed and transformed through human engagement with digital installations in public realm. In this sense, the**

study relates closely and contributes to the seminal study of Carmona et al. (2003 [2010]) on the dimensions of urban design. Carmonal et al. (2003 [2010]), taking a holistic approach, developed a framework based on the six fundamental dimensions of urban design; The *morphological, the perceptual, the visual, the social, the functional and the temporal dimension*. This framework provides a comprehensive overview to urban development, renewal, management, planning and conservation processes. The current study critically adds to this framework, broadening the understanding of five of these dimensions- visual and morphological (contextual), social, perceptual and temporal, in the emerging context of digitally augmented public space.

Ultimately, this study supplements the vast body of fundamental **place-centred urban frameworks** that identify sets of variables that improve quality of public space and urban environment. For example, **Tibbalds (1988, 1992, 2000)** considers the qualities of *human scale, respect of context, promotion of joy, delight and visual intricacy, community engagement, social mix and adaptability of environments* as fundamental principles of urban design. Evidently, this study reveals the key role of carefully designed urban media interventions in the enhancement or even development of all aforementioned qualities in urban settings. From a similar perspective, **Bentley et al., (1985)** in their influential study *Responsive Environments: A manual for urban designers* stressed the need for more *democratic and enriching environments* focusing on seven fundamental issues; *permeability, variety, legibility, robustness, visual appropriateness, richness and personalization.* Again, findings of this research, having discussed most of these critical issues in the context of digitally augmented urban environments- especially those of *variety, legibility, visual appropriateness, richness and personalization,* promote a better understanding of the importance of urban digital installations within the broad context of urban design. In the same vein, this study's findings articulate the association of urban media interventions with the qualities of *Liveability, Identity, Access to opportunities, Imagination and Joy, Community and Public life and Social inclusion* in the city which, according to the critical study of **Jacobs and Appleyard (1987: 115-116)**, are the seven goals 'essential for the future of a good urban environment'.

Fundamentally, as discussed in section 3.1.2 and 3.1.3 this study builds upon **Stevens (2006)** framework, particularly upon the concept of *Props*, which in turn comprises a re-evaluation of Lynch's (1960) famous urban model. Stevens (2006) uses the term Prop to describe local urban 'landmarks' in human scale, the role of which is not restricted in

aiding way-finding- due to their unique appearance. Yet, being able to facilitate direct action they, ultimately, engage lively human experience and human encounters. This study proceeding along this path and after having reviewed the current literature on the nature and types of urban digital installations revealed a new classification of them which is closely related to this of Landmarks and Props; Digital interventions as infrastructure and Digital interventions creating place experience. This classification, drawing on fundamental debates of urban design theory and practice, discovered a new approach to media architecture that primarily focuses on the experiential quality and 'human-friendliness' of urban media interventions while, also, establishing the foundations for the conceptual framework of this study.

Place experience

In the context of this study, the notion pf place experience was explored and (re)defined through the analysis, interpretation and synthesis of the fundamental theoretical approaches to place concept. The idea of place experience was further then contextualized in the setting of urban public space through the following integration of key approaches to the concept of public space. This particular conceptualization of human experience in public space, being the '*reciprocal, dynamic and inseparable contact with a space and its elements which encompasses both subjective and objective features affecting human behaviour and interaction with this environment and is also developed upon three major dimensions; spatial context, social activity and perceptions',* although it can be partially associated to other relevant approaches to place and experience, forms a key conceptual and theoretical contribution of the study.

Methodological

As discussed in section 3.5 the identified gap in the literature could be highly related to the complex and versatile nature of interpreting and uncovering place experience in dynamic digitally enhanced urban environments and, also, due to challenges in terms of measuring and evaluating aspects associated with human experience and performance.

To carry out this study, an integrative methodology to assess and evaluate human experience in digitally augmented public spaces was developed and, therefore, it is possible for the approaches applied in this research work -both in terms of theoretical and conceptual framework, as well as in terms of methodological framework- to be valuable tools for researchers, designers, planners and decision makers to evaluate

human experience of their urban media environments and/or apply any necessary adjustments to improve their effect on the city and its citizens.

Particularly in terms of urban design theory and practice, the methodology of this study could potentially inform existing frameworks of successful urban design as these digital artefacts can be assessed as elements of the physical environment of the city. Thus, the evaluation of urban media interventions and digital enhancement of public space could be possibly integrated into traditional urban evaluation schemes such as *The Seven principles of Good Design* introduced in the Urban Design Compendium (Llewelyn-Davies, 2000) , or What Makes A Successful Place? Included in The Councillor's Guide To Urban Design (Design Council, 2003), or even into the Tactical Urbanist's Guide to Materials and Design (Street Plans Collaborative, 2016).

Practical

Contribution to applied urban design frameworks and policy

The summary of findings in section 9.1 have not only provided an understanding of how urban media interventions can impact on human experience and configuration of public space, but also suggested a number of practical design and planning considerations through which architects, media artists, planners and stakeholders can achieve high quality digitally enhanced public spaces that promote human engagement and interaction (refer also to section 8.3). The overarching idea of this set of empirical considerations is **to look at the spaces that facilitate media installations as digitally enhanced 'wholes' of the city which strategically need to respond and create dialogue with their physical, social, environmental and cultural context**. Therefore, the insights gained from this study can be valuable to inform fundamental urban frameworks applied in the UK context.

a) National Planning Policy Framework and National Design Guide

The National Planning Policy Framework (NPPF) establishes the Government's planning policies for England as well as the ways these should be applied. It mainly offers a framework within which locally developed plans can be prepared (MHCLG, 2019). National Planning Policy assesses the social, economic, cultural and environmental qualities of new developments aiming to ensure that plan-making, decision-making and architecture deliver high quality outcomes for current and future generations. Within the

broad context of NPPF, the National Design Guide (NDG) sets out the qualities of well-designed places and illustrates what good design means in practice. Both NPPF and NDG are frequently updated in order to take into consideration emergent needs, opportunities or constraints. As urban design and architecture have opportunities that never had before, and urban settings are constantly mediated by various forms of technology within insufficient regulatory frameworks, it becomes evident that urban policy needs to keep up with these developments. Thoroughly informed policy on urban media developments can result in more cohesive communities by promoting user participation and careful socio-contextual appraisals. On the other hand, a weak or no provision may lead to disapproval of interventions by the public, disinterest or even vandalism. Ultimately, findings from this study can set the foundations for the creation of a more comprehensive regulatory framework for urban media interventions and initiatives proposing policies and guidelines for situated digital technology in urban planning schemes that be in turn incorporated into national urban policy frameworks.

b) Local Plans and Design and Supplementary Planning Documents (SPDs)

The role of the Local Plans is to establish a vision and a framework for the future development of a particular area, addressing needs and opportunities related to housing, community, facilities and infrastructure operating within National Planning Policy Framework (www.gov.uk/guidance/local-plans). Supplementary planning documents (SPDs), building upon Local Plans, offer more detailed guidelines on specific dimensions. Although not introducing new planning policies, SPDs are considerable resources in decision-making (ibid). It is essential that both Local Plans and respective SPDs are constantly informed id order to successfully reflect the requirements and prospects of each community.

The introduction of media interventions in public space requires various design and feedback cycles as well as assessment of their effects during and after their implementation. **This poses a challenge for local planning and administration to evaluate the impact of such interventions on public life, townscape and the urban environment. In this case, the development of digital infrastructure plan and assessments through multidisciplinary approaches combining input from designers, architects, planners, user experience experts and the community can be vital for the sustainable development of such digital strategies at local and national level.** The findings of this study contribute in several ways to the understanding

of urban media interventions as part of local planning and programming, providing a basis for the design of a comprehensive and multidisciplinary assessment framework for urban digital infrastructure at various scales. Such assessment protocols being incorporated or accompanying Local Plans in the form of individual SPD can highlight the value added through the thoughtful planning, design and curation of urban media interventions in the quality of built environment and life of citizens.

9.5 Limitations

When considering the insights above, it is critical to recognize the limitations of the study. First of all- as it is often noticed in case studies and especially the ethnographic ones- similar applications in different spatial, social or temporal contexts might generate different results. Furthermore, the study faced challenges during the collection of interview data from decision makers which was more time-consuming than expected. It also had to be conducted in multiple phases due to the busy schedule of the interviewees, especially the event's sponsors. Therefore, the number of people involved in the design and application of the studied urban media interventions that have been interviewed is relatively limited (four designers, four event staff members, the event curators and the main sponsor). However, this does not risk the reliability and validity of the research because, as noted by Flick (2009), in the process of obtaining information from interviews the major criterion for validity is the relevance of the interviewee rather the number of people interviewed. Individuals and teams interviewed for the study have been the key factors involved in the planning, design and content the media installations of LightWaves2018 festival.

There is also limitation in the people involved in the psychophysiological experiment conducted in the wild. The number of people that participated in the experiment by providing either only self-reported psychological data (n=20) or both self-reported and physiological data (n=10) could have been even higher in case more time and resources had been available. Yet, this limitation does not affect the trustworthiness of the overall psychological findings as this method was used for the collection of supporting data to the field observations, discussions with people and interviews with experts and event's staff members.

It is also crucial to point out that the limitations and challenges that have been identified emerged largely from the review of a number of research studies that have been considered as successful representatives of research in the fields explored. In author's view, those studies reflect major strategies and challenges faced by various other similar implementations. Nevertheless, it is acknowledged that a different set of representative studies could potentially highlight some of the limitations more than others or even reveal new ones. Ultimately, it is hoped that future research in human experience in digitally augmented urban environments could expand the analysis and enrich the methodology suggested in this study.

9.5 Directions for future research work

As noted previously the research focused on the investigation of place experience in a network of digitally augmented public spaces within the particular socio-spatial context of MediaCity in Manchester, UK. Therefore, it is recommended that future research should involve the exploration and comparison of the effects of this phenomenon on other geographical, social, cultural and temporal contexts focusing on the variations of human experience in them.

Furthermore, as frequently highlighted in this study, there's seems to be an association between the restorative effect of certain types of artificial light during the winter and the application of media art and architecture installations in public space (see for example section 8.1.5 and 7.3.1). There may be, then, an opportunity to integrate the two initiatives, the implementation of public light therapy devices and urban media art installations, that warrant inquiry. In this respect, the collection of psychophysiological data indicating human stress levels and mood variations could act as a primary research technique, be explored further and consequently, optimized.

Finally, as discussed earlier, this study found a significant impact of engagement with urban media installations on human proxemics and the reduction of individuals' physical distance in public realm (refer to section 7.2.3). Paradoxically, the major part of the writing of this thesis was conducted during the difficult time of corona virus pandemic, which has been inevitably associated with the policy of lockdown as well as the measures of social distancing and quarantine implemented across the world. These restrictions affected not only the amount of social life in public spaces during their implementation but also the

quality of human interaction afterwards, since people- even after the lockdown, still remain conscious and hesitant to human contact. This research showed that the engagement with urban media installations in public space can make people feel less lonely and socially isolated, while psychologist- play therapist Antigoni Grizi (Int.PS1) almost prophetically noted during our interview that media interventions have the opportunity *"[…] to bring back days that relaxing moments and social warmth was the norm and not a rare event".* In this respect, a final recommendation for future research work would be the examination of urban media interventions' potential to act as opportunities to bring people out of their house and bring them back smoothly, fearlessly and safely closer together in open public spaces during a post-Covid19 era.

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Appendix A

Pilot Study 1, Light Night Leeds, 4&5/ 10/ 2018

- Aspects studied during field observations

Urban dynamics and social activity

Location	Installation	Population and User profile	Size, density and distribution of human encounters	Duration of stay and distribution	Main routes
Area 1 Victoria Gardens	Bouquet D'abat Jour (Lampshades Bouquet)				
Area 2 Millennium Square	Chaos				
Area 3 Sovereign Square	Heofon Lightmaze				
Area 4 Trevelyan Square	Celestial SoundCloud				

1. On-site Discussion with people

- Do you live here in Leeds?
- Have you attended this event before? If yes, what are your impressions?
- How do you think that the city and public space changes after the implementation of the installations?
- Would you enjoy similar initiatives taking place more often?
- Which installations did you enjoy the most and why?

2. Interview with installation designer

- What is the main design concept of Celestial Soundcloud?
- How do you believe the installation can transform the public space where it is located?

- Do you believe that the particular location is suitable for this installation and why?
- What are the primary user/age groups engaging with the installation?
- What are the were the main challenges when designing, developing and implementing this piece?



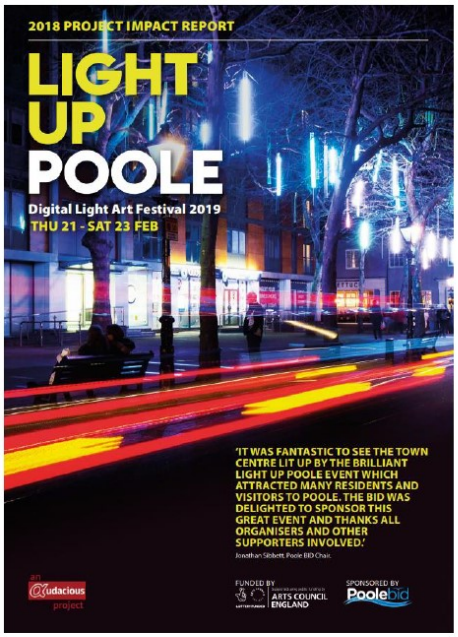


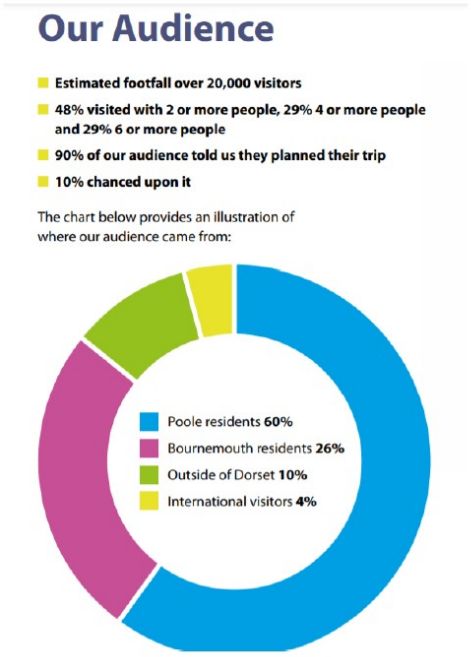
For more information about the event please visit https://whatson.leeds.gov.uk/lightnight/Documents/Light%20Night%202018%20brochure.PDF

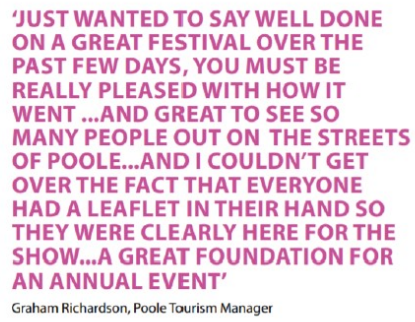
Appendix B

Pilot Study 2, Light Up Poole, 21&22/ 02/ 2018

1. Assessment of Project Impact report

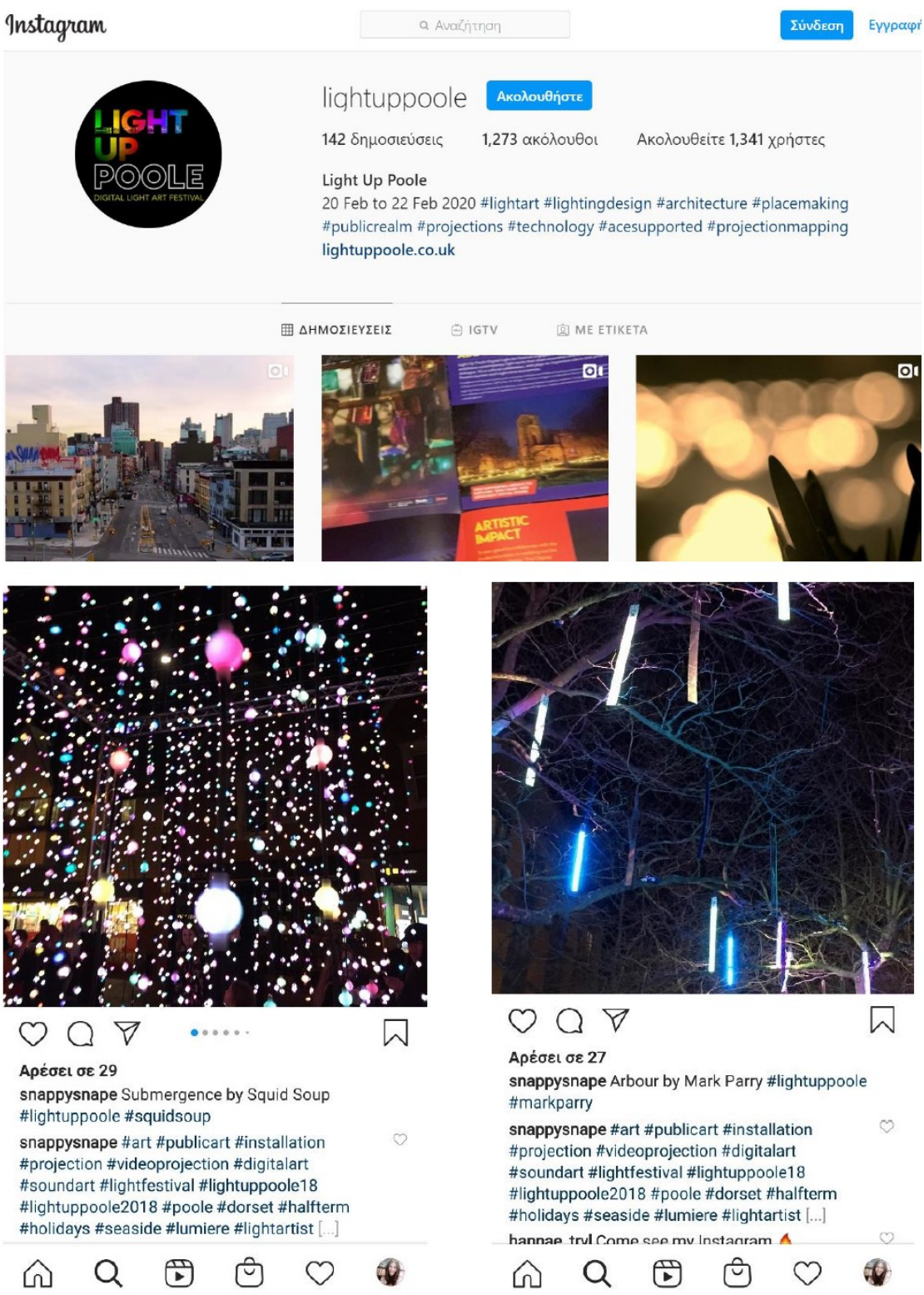






For more information about the event visit https://lightuppoole.co.uk/wp-content/uploads/2018/08/LUP-Impact-Report.pdf

2. LightUp Poole on Instagram



Appendix C

Data collection for site analysis

Ethnographic On-site discussions

To understand more precisely people's perceptions and impressions of the site itself, on-site discussions took place with 50 people from various demographic groups

- People

User	Gender	Age	Area	User	Gender	Age	Area
U1	Female	72	Salford	U22	Female	45	Trafford
U2	Male	75	Salford	U23	Male	35	Eccles
U3	Male	43	Weaste	U24	Male	40	MediaCity UK
U4	Male	50	MediaCity UK	U25	Female	43	Trafford
U5	Female	55	Manchester city centre	U26	Male	29	MediaCity UK
U6	Male	25	Salford	U27	Female	35	Eccles
U7	Female	43	MediaCity UK	U28	Male	58	Manchester city centre
U8	Female	46	Salford	U29	Female	28	Salford
U9	Male	55	Weaste	U30	Female	47	Trafford
U10	Male	48	Salford	U31	Female	37	Salford
U11	Female	34	MediaCity UK	U32	Female	35	Weaste
U12	Male	38	MediaCity UK	U33	Male	28	Salford
U13	Male	26	Salford	U34	Male	39	Weaste
U14	Male	45	Manchester city centre	U35	Female	33	Weaste
U15	Female	73	Salford	U36	Male	27	MediaCity UK
U16	Female	45	Salford	U37	Male	29	MediaCity UK
U17	Female	57	Trafford	U38	Male	33	Trafford
U18	Male	28	Salford	U39	Female	57	Salford
U19	Male	53	Hulme	U40	Female	45	Trafford
U20	Female	35	MediaCity UK	U41	Male		MediaCity UK
U21	Male	76	Moss Side				

- Questions

1. Have you been here before?

2. If yes, what do you consider as the most important pros and cons of the area?

3. Which public spaces do you most enjoy here in Salford Quays and why?

Appendix D

Main ethnographic data collection

Aspects studied during field observations

a) Urban dynamics and social activity

Location	Population and User profile	Size, density and distribution of human encounters	Duration of stay and distribution	Main routes
Area 1 Plaza				
Area 2 Gardens				
Area 3 Waterfront Promenade				
Area 4 Enclosed Square				

b) Individual perceptual experiences

Location	Emotional reactions and comments (on installations)	Walking patterns and speed	Human expression/ Bodily engagement	Behaviour to strangers
Area 1 Plaza				
Area 2 Gardens				
Area 3 Waterfront Promenade				
Area 4 Enclosed Square				

c) Walking Patterns

Date_____ Weather_____

Time_____ Location/ Area_____

- **'Purposive walking'** is a 'necessary activity' performed while aiming for a destination (Gehl, 1987, p. 135). It is a walking task. We refer to it as 'walking to' or 'walking towards'. It connects A to B to C and further on, and is normally of a constant rhythmical and rapid pace. For this reason, purposive walking is performed in a rather anxious mode, in which we long for arrival at a destination.

- **'Engaging walking'**, as opposed to purposive walking is a spontaneous way of walking characterized by varying pace and rhythm. It is engaging and discursive because its pace and rhythm are synchronized with the walker's own internal bodily rhythms (biological and psychological) whilst experiencing and swinging along with the places' own moving rhythms, and being sensitive to external paces and temporalities in urban space

Purposive	Engaging

*Also, take photos and videos

Total number of Passengers:

Estimated duration of study: 30 min

People interviewed during on-site discussions

User	Gender	Age	Area	User	Gender	Age	Area
U1	Male	45	Trafford	U34	Male	57	Salford
U2	Male	28	MediaCity UK	U35	Female	46	MediaCity UK
U3	Female	32	Salford	U36	Male	43	MediaCity UK
U4	Male	21	MediaCity UK	U37	Male	37	MediaCity UK
U5	Female	32	MediaCity UK	U38	Male	27	MediaCity UK
U6	Male	72	Trafford	U39	Male	45	Eccles
U7	Male	36	Weaste	U40		51	Weaste
U8	Female	45	Weaste	U41	Female	42	Manchester city centre
U9	Male	18	Salford	U42	Female	36	Manchester city centre
U10	Male	19	Salford	U43	Female	66	Trafford
U11	Male	18	Salford	U44	Female	30	Trafford
U12	Male	35	MediaCity UK	U45	Male	63	Salford
U13	Male	40	MediaCity UK	U46	Female	55	Salford
U14	Female	30	Eccles	U47	Male	36	MediaCity UK
U15	Female	32	Weaste	U48	Male	45	Manchester city centre
U16	Female	45	Manchester city centre	U49	Female	50	Salford
U17	Female	72	Hulme	U50	Male	36	Eccles
U18	Male	29	MediaCity UK	U51	Male	52	Salford
U19	Female	33	Trafford	U52	Male	32	Salford
U20	Female	36	Eccles	U53	Female	45	Hulme
U21	Female	52	Salford	U54	Female	38	Weaste
U22	Male	29	MediaCity UK	U55	Female	75	Trafford
U23	Female	31	MediaCity UK	U56	Male	63	Salford
U24	Female	35	Salford	U57	Male	35	Manchester city centre
U25	Male	72	Weaste	U58	Male	56	Salford
U26	Male			U59	Male	63	Hulme
U27	Male	65	Manchester city centre	U60	Female	40	MediaCity UK
U28	Male	70	Trafford	U61	Female		Trafford
U29	Male	48	Eccles	U62	Female	73	Weaste
U30	Female	36	Manchester city centre	U63	Female	37	Weaste
U31	Male	45	Salford	U64	Female	75	Weaste
U32	Male	35	MediaCity UK	U65	Male	55	Salford
U33	Male	31	MediaCity UK				

Appendix E

In depth and semi-structured interviews

1. Interviewee details

a. Semi-structured (16)

b. In-depth (6)

Type of Interview	Interviewee		Role
(a) Semi-structured	Stanza	**(Int.D1)**	Installation Designer/ Media Artist
	Maria Almena, Kimatica Studio	**(Int.D2)**	Installation Designer/ Media Artist
	Ingo Kalecinski, GNI Projects	**(Int.D3)**	Installation Designer/ Media Artist
	Gonzalo Soldi, HUB Studio	**(Int.D4)**	Installation Designer/ Media Artist
	Pr. Collin Ellard PhD Behavioral Psychology	**(Int. NS.1)**	Neuroscientist, Psychologist, Professor of Cognitive Neuroscience University of Torondo Director of Urban Realities Laboratory
	Antigoni Grizi MSc Psychology, Play therapy and Dance Therapy	**(Int.PS1)**	Psychologist- Play Therapist Nottingham City Council
	Valia Papadopoulou MSc Psychology	**(Int.PS2)**	Psychologist NHS UK
	Adam Powdrill BSc Psychology	**(Int.PS3)**	Psychologist Sutherland House School - Autism East Midlands

	Michaela Kekeri MSc Architecture and Urban Design	**(Int.UD1)**	Urban Designer Avison Young, UK
	Jennifer Taylor	**(Int.C1)**	Event Curator Quays Culture
	James Whitaker	**(Int.SP1)**	Event sponsor Peel Group
	Eve Yarwood	**(Int.S1)**	Food truck owner in the area (located at the Plaza)
	Jonas Kaldwin, Security staff, 24, Salford	**(Int.S2)**	Event's security staff Quays Culture
	Kitty Briggs, Security staff, 25, Charley	**(Int. S3)**	Event's security staff Quays Culture and Lowry Theater
	Bethany Dean, 25, Bolton, security staff	**(Int.S4)**	Event's security staff Quays Culture
	Carol Lamb	**(Int.S5)**	Installation Supervisor Quays Culture
(b) In depth Phenomenological Interviews	Nadia Lazaridou	**(Int. P1)**	Field experiment participant
	Brittany Kingwood	**(Int.P2)**	Field experiment participant
	Kate Andreadaki	**(Int.P3)**	Field experiment participant
	Rob Ozolins	**(Int.P4)**	Field experiment participant
	Vasilis Adamidis	**(Int.P5)**	Field experiment participant
	Peter Vourvachis	**(Int.P6)**	Field experiment participant

2. Interview questions

a. Semi-structured

Designers

- What is the main vision behind your art projects and how does X installation delivers that vision?
- What type of public space do you consider as most appropriate to accommodate your installation (i.e. typology-size-shape/ location/ area's character/ environment/ social-cultural-built context) and why?
- How do you feel that such interactive installations are able to transform public space and user's urban experience (i.e. spatially-physically/ socially/ sensorily/ emotionally)?
- What are the main feelings/ reactions aimed to be triggered through user's interaction with the Heartbeat and why are these feelings significant?
- How important is user's playful self-expression and/or bodily engagement with the artwork? Do you believe that this collective bodily engagement with the installation contributes to the creation of shared memories and community feelings or does it work mostly as a self-reflection activity?.
- What were the main challenges throughout the design, development and application of the Heartbeat?
- How would you consider to further develop your projects?

Neuroscientist

- In the *Happy Streets Living Lab* study on tactical interventions, where you were part of the research team, it was concluded that cities can "improve wellbeing through interventions that inject nature, colour, and unique elements into public space." **Do you believe that the same applies for the injection of (interactive) digital element as well? If yes, do you consider any key features that could potentially differentiate dynamic digital interventions in the city from the traditional tactical ones?**

- Events including the application of media art (like digital light events) are getting more and more popular recently, especially in Northern contexts during the winter period. Interestingly, they have proved to have impact on the level of population of public spaces during the period of their application, on the duration

of users' stay in the area as well as on the quality of social interaction and human behaviour. My study involved the examination of a set of digital artworks and installations placed for 10 days in several locations in the public space of MediaCity, UK. According to the initial findings derived from data extracted through several studies, the number of people as well as the duration of their stay in most areas were 2-4 times higher*. Moreover, they showed the willingness to (re)explore the place in this new digital context and they were clearly more open and sociable in their communication with others, strangers or not. Also, most of them described their feelings/experience with words such as "amazing", "interactive", "happy", "relaxing", "excited". **What is your perspective on the idea of improving the "feeling" of a place and enhance human activity through such urban gestures? Also, do you believe that strategies like this can help fighting "winter blues" which is so common in Northern countries?**

- One distinctive feature of the interaction with digital installations and artworks is that of *playfulness and self-expression*. Initial findings of a psychophysiological experiment (including a combination of surveys and psychometric tests along with measurements of skin conductance and heart rate), conducted as part of my study, indicated that participants showed more positive emotions and greater levels of sociability towards strangers while engaging with multi-sensory interactive installations rather while engaging with the non-interactive/ static ones. They also tended to feel more welcomed in those areas. **(How) do you believe that such playful experiences in public space can affect the general state of psychological and societal wellbeing in the city?**

- In your article *The Psychological Value of Public Art* you mentioned *"[…]The art transformed my experience of the street. I felt curious, lively, amused and excited. I stopped, looked around in wonder as if trying to glean more clues as to the meaning of what I was seeing"* referring to an art fence you stumbled onto while walking across a dense part of the city. **(How) do you believe that types of creative digital placemaking/ art strategies can help to create a more pleasant, stimulating and sensory rich urban environment through the redefinition of the "casual" urban experience? Could these environments**

have potential to become psychologically restorative through their association with ART and SRT theories?

- In the context of rapid urbanisation in most contemporary cities, urban regeneration strategies are prevalent for the provision of residential developments, workplaces and amenities. However, a lot of these projects have been criticised as they seem to have had problematic impacts and significant failings in terms of liveability and streetscape animation as well as lack of social and human ideals, as they have as a main priority the delivery of a particular, pre-established design brief. **Do you believe that a range of strategies including the temporal application of playful interactive installations could add a level flexibility and sense of place and potentially restore the loss of human spontaneity, participation, pleasure and social contact in this type of urban schemes by providing a more human-friendly and diverse experience? If yes, how?**

Psychologists (Int.PS2, PS3)

- What do you think the positive impacts of **public art and creative initiatives** are for mental and psychological wellbeing of citizens?
- Living in big 'fast-paced' cities has often been associated with feelings of social isolation and high levels of anxiety and depression. Do you feel that outdoor interactive installations designed to offer shared experiences and 'lively happy moments' **could potentially enhance the social and psychological sustainability of public space**? If yes, why?
- Do you believe that interactive digital installations could help adults to **playfully explore and express themselves and/or improve their social skills**? If yes, how?
- (How) do you believe that the application of urban media art strategies can help to create **a more pleasant, stimulating and sensory rich urban environment through the redefinition of the "casual" city experience**? Especially during the **winter months**, with shorter days and longer nights, could these digitally enhanced environments have the potential to **become psychologically**

restorative by improving the emotional state of the citizens through the application of **artificial light as a tool to fight 'winter blues'** ?

Psychologist- Play therapist (Int.PS1)

- What could be the potential **behavioral and emotional benefits** of play and bodily engagement with interactive installations?
- Do you believe that interactive digital installations could help adults to **playfully explore and express themselves and/or improve their social skills**? If yes, how?
- Living in big 'fast-paced' cities has often been associated with feelings of social isolation and high levels of anxiety and depression. Do you feel that outdoor interactive installations designed to offer shared experiences and 'playful moments' **could potentially enhance the social and psychological sustainability of public space**? If yes, why?
- Do you believe that engaging with such installations in public space is equally important for children and adults and why? Is there any **specific user group** (kids, elderly, people with special needs, mobility difficulties, autism, dementia etc.) that could particularly benefit from the interaction with such digital urban equipment?
- Are there any crucial aspects that an interaction designer should keep in mind, when designing installations for full bodily engagement, in order to maximize their potential? (eg. size, scale, colors, function, location, performance)

Urban Designer

- What do you think the positive impacts of public art and free cultural events are for a city and its citizens? Particularly, how would you describe **the role of art and culture-led regeneration in urban growth** and transformation?
- Do you feel that digital urban strategies (urban media art, digital art events, light festivals, interactive installations) are able to **re-innovate and enrich the traditional urban environments** and everyday experiences? If yes, why could that be important?
- What are the potential benefits of digital enhancement of public spaces in terms of their **visual/morphological (re)definition, social activity/ human interaction, economic growth and cultural prosperity**?

- Living in big 'fast-paced' cities has often been associated with feelings of social isolation and high levels of anxiety and depression. Do you feel that outdoor interactive installations designed to offer shared experiences and 'lively moments' **could potentially enhance the social and psychological sustainability and feeling of community in public space**? If yes, why?
- How could **urban design and placemaking benefit from digital interventions and media architecture**[7]? How do you believe digital placemaking[8] could contribute to shaping the **"future" city** and public space?

Event Curator

- What is the main vision behind the art projects organised by your team and how does LightWaves festival deliver that vision?
- What are the most valuable impressions gained this year from LightWaves festival and how would you describe people's engagement with it?
- Did you apply any changes in LightWaves2018 in comparison to event's previous versions in terms of planning, performance and/or content of installations? If yes, could you describe any effects of these changes?
- What do you consider as the major strengths and challenges of LightWaves event?
- Do you believe that public spaces of MediaCity have been successfully activated after the application of the digital interventions? How do you feel that such strategies are able to re-innovate and enrich the traditional urban settings especially, probably, during cold winter days? Which installations/ locations of the event were more popular to the audience during LightWaves 2018 and which do you think are the main reasons behind this success?
- How do you believe user's urban experience has been transformed through the application of such outdoor digital installations(spatially/visually-aesthetically/ socially/communicationally/ emotionally/ psychologically etc.) and which do you consider as the major contributions of such interventions in the public space of media city?

[7] The incorporation of specific media in the design of architectural elements that can convey their own dynamic information or trigger sensory experiences

[8] The augmentation of physical places with location-specific digital services, products or experiences developing a form of a "hybrid space" in order to change the way a space is perceived and experienced

- Do you believe that similar digital initiatives can potentially shape the “future” city and why?
- How would you consider to further develop LightWaves festival?

Event’s security staff

- Have you worked for a similar event before? If yes, s there anything that makes this one special or different?
- Would you like to take part in this experience and why?
- How would you describe with a few words people’s experience here according to their behaviour? (Happy, excited, impressed, curious, indifferent, concerned)
- Are there any changes in area’s population after the start of the event? (More/ Less crowded, different user groups, longer/ shorter stay, different visiting hours)
- As an observer of the area, what is your opinion on people’s interaction here? (Positive/ negative atmosphere, introvert/ extrovert participants, encounters with strangers)
- Do you feel/ believe that place is safe and why?
- Are people generally willing to engage with the installations or do they prefer watching the others engaging with them? (or do they just ignore them?) If yes, are there any specific age groups that you have noticed participating?
- As a person living in a city and also as an observer of this happening, what is your perspective on digital interventions like this/ these? (Positive, Negative, Neutral, would you change something?, etc.)
- How would you describe/ do you consider people’s overall mood and impressions after their visit?

Event Sponsor

- Why **did you decide** to support LightWaves event?
- How is Peel Group, as an investment enterprise, **benefiting by this support**?
- Do you believe that LightWaves event could support one of the primary concepts behind **MediaCity's regeneration**, which is to become a leading international hub for the creative and digital sectors? If yes, how?
- What are your **main impressions in the aftermath** of the event? Have you noticed any valuable changes or development in comparison to its previous versions?

- Which do you consider as the **main contributions** of the festival in terms of the the economic, social and spatial viability of MediaCity UK?
- Which do you consider as the respective primary **challenges** of it?

b. In-depth

- *(For the locals)* How satisfied are you with the neighbourhood environment of MediaCity?Could you briefly mention/ describe the major advantages and disadvantages of living in this area?
- *(For the locals)* Do you believe that Lightwaves festival had managed to change your normal winter urban experience/ routine of MediaCity at that time? If yes, in what sense? (eg. stay out more/ less, interaction with other people, your mood, spatial arrangement of public realm, etc.)
- Can you mention mention the 3 primary feelings/ words/ reactions that best describe the following 5 digital experiences for you (eg. happy, active, engaging, affection, confusing, sophisticated, love, bounding etc.)
- Which part of (outdoor) public space of MediaCity do you mostly enjoy (MediaCity plaza, the Lowry square, MediaCity Gardens, the waterfront promenade-stairs) and why?
- Would you like to see digital interactive interventions taking place more often in your area and why?
- What do you believe would make the experience of Lightwaves event better (eg.number and location of installations, duration, installations' design-scale-quality-level of interactivity, target audience, etc.)?

Appendix F

Field-based Psychophysiological Experiment

1. UWIST Mood Adjective Checklist (UWIST-MACL)

UWIST Mood Adjective Checklist (UMACL)

(Matthews, Jones & Chamberlain 1990a).

Variable

The UMACL is an adjective checklist that assesses mood, building on three-dimensional, bipolar factor structures for mood (Schimmack & Grob, 2000; Sjöberg, Svensson, & Persson 1979). It measures three, correlated bipolar dimensions of Energetic Arousal, Tense Arousal and Hedonic Tone. It also includes a supplementary, mono-polar dimension of Anger-Frustration. The Energetic Arousal and Tense Arousal scales are modifications of the corresponding Thayer (1989) AD-ACL scales. Hedonic Tone refers to the overall pleasantness of mood.

Description

The UMACL is comprised of 29 adjectives, eight for each of the scales, and five for Anger-Frustration. Instructions are: *'Please indicate how well each word describes how you feel at the moment'* scored on a 4-point response scale, showing the UMACL is a measure of transitory emotional states.

Sample

The sample for the initial study of the UMACL (Matthews et al., 1990) was made up of 230 Welsh students, and 158 members of the general public taking a keyboard training course. The sample included 210 females and 178 males.

Reliability

Internal Consistency

Cronbach alpha coefficients for the three principal scales ranged from .86 to .88 (Matthews et al., 1990a; $N = 388$). A further study (Matthews et al., 2002) reported a similar range of alpha coefficients ranging from .82 to .88 ($N = 788$).

Test–Retest

In several subsamples of the Matthews et al. (2002) sample, participants completed the UMACL before and after performance on one of several cognitive tasks, typically of 10–15 min in duration. Correlations between pre-test and post-test scores ranged from .43 to .47 ($N = 517$). One subsample ($N = 112$) performed a working memory task on occasions separated by three weeks. The test–retest correlations for post-task mood ranged from .14 to .48. An occupational subsample ($N = 86$) performed a work simulation on two occasions approximately six months apart, whereby test–retest correlations ranged from .17 to .39, as expected for a situationally-sensitive mood-state measure (Matthews et al., 2002).

Validity

Convergent/Concurrent

Matthews et al. (1990) reported that the UMACL Tense Arousal scale correlated positively with the 8SQ Anxiety scale (.52). Also, the correlation between Eysenck's (EPI) Neuroticism scale and the UMACL Tense Arousal scale was found to be .38 (Matthews et al., 1990a). Matthews et al. (1990a,b) also reported that the Energetic Arousal scale correlated significantly with tonic skin conductance level (.32), and the Tense Arousal scale correlated negatively (−.38) with cardiac inter-beat-interval, consistent with Thayer's evidence that self-report arousal converges to some extent with autonomic arousal. Matthews et al. (1999) assessed the 'Big Five' using Goldberg's (1992) adjectival measure ($N = 229$). Energetic Arousal correlated with Conscientiousness (.20); Tense Arousal correlated with Neuroticism (.20); Hedonic Tone correlated with Agreeableness (.14).

Divergent/Discriminant

Matthews et al. (1990) reported that the UMACL Energetic Arousal scale correlated negatively with the 8SQ Fatigue scale ($R = -.81$); and that the Hedonic Tone scale correlated negatively with the 8SQ Guilt scale (−.78). Matthews and Gilliland (1999) reported correlations between the UMACL and the Eysenck personality dimensions that establish divergence from these traits. Data were reported from two samples ($N = 158$; $N = 762$). Neuroticism correlated more highly than extraversion with each of the three UMACL scales. In the larger of the two samples, correlations between Neuroticism and mood were −.13 for Energetic Arousal, and −.28 for Hedonic Tone. Matthews et al. (1990a) also showed that scales were only weakly related to various demographic factors and to a social desirability measure.

Criterion/Predictive

Matthews et al. (1990a) demonstrated that the UMACL Hedonic Tone scale is more sensitive to monetary reward than either of the arousal scales. The UMACL scales, especially Energetic Arousal, also predict objective measures of attention in performance studies (Matthews, Davies, & Lees 1990b). The UMACL is sensitive to a range of experimental manipulations of stress and has been used to assess state responses in studies of cardiovascular effort-regulation (de Burgo & Gendolla, 2009), dietary supplements (Brown et al., 2009), glucose regulation in diabetes (Hermanns et al., 2007), and circadian rhythms (Martin & Marrington, 2005). The UMACL has also been used in field studies of stressors such as driver stress (Matthews, 2002) and test anxiety (Matthews et al., 1999).

Location

Matthews, G., Jones, D.M., & Chamberlain, A.G. (1990). Refining the measurement of mood: The UWIST Mood Adjective Checklist. *British Journal of Psychology, 81*, 17–42.

Results and Comments

The UMACL is an elaboration of Thayer's (1989) AD-ACL and shares the strengths of that instrument in assessing subjective arousal in a variety of experimental and field settings. The inclusion of a Hedonic Tone scale provides more comprehensive coverage of mood. The supplementary Anger-Frustration scale is not well distinguished from low Hedonic Tone psychometrically (Matthews et al., 1990a), but it may be useful in studying certain issues, such as driver aggression (Matthews, 2002).

UWIST MOOD ADJECTIVE CHECKLIST

Instructions: This questionnaire is concerned with your current feelings. Please answer **every** question, even if you find it difficult. Answer, as honestly as you can, what is true of **you**. Please do not choose a reply just because it seems like the 'right thing to say'. Your answers will be kept entirely confidential. Also, be sure to answer according to how you feel **AT THE MOMENT**. Don't just put down how you usually feel. You should try and work quite quickly: there is no need to think very hard about the answers. The first answer you think of is usually the best.

Here is a list of words which describe people's moods or feelings. Please indicate how well each word describes how you feel **AT THE MOMENT**. For each word, circle the answer from 1 to 4 which best describes your mood.

	Definitely	Slightly	Slightly not	Definitely not
1. Happy	1	2	3	4
2. Dissatisfied	1	2	3	4
3. Energetic	1	2	3	4
4. Relaxed	1	2	3	4
5. Alert	1	2	3	4
6. Nervous	1	2	3	4
7. Passive	1	2	3	4
8. Cheerful	1	2	3	4
9. Tense	1	2	3	4
10. Jittery	1	2	3	4
11. Sluggish	1	2	3	4
12. Sorry	1	2	3	4
13. Composed	1	2	3	4
14. Depressed	1	2	3	4
15. Restful	1	2	3	4
16. Vigorous	1	2	3	4
17. Anxious	1	2	3	4
18. Satisfied	1	2	3	4
19. Unenterprising	1	2	3	4
20. Sad	1	2	3	4
21. Calm	1	2	3	4
22. Active	1	2	3	4
23. Contented	1	2	3	4
24. Tired	1	2	3	4
25. Impatient	1	2	3	4
26. Annoyed	1	2	3	4
27. Angry	1	2	3	4
28. Irritated	1	2	3	4
29. Grouchy	1	2	3	4

Notes:

The UMACL is available from Gerald Matthews at the Institute of Simulation and Training, University of Central Florida, 3100 Technology Parkway, Orlando, Florida, 32826, USA.

Source: Boyle, Gregory J. & Helmes, Edward & Matthews, Gerald & Izard, Carroll. (2015). Measures of Affect Dimensions. 10.1016/B978-0-12-386915-9.00008-5.

2. Galvanic Skin Response

"The galvanic skin response (GSR, which falls under the umbrella term of electrodermal activity, or EDA) refers to changes in sweat gland activity that are reflective of the intensity of our emotional state, otherwise known as emotional arousal.

Our level of emotional arousal changes in response to the environment we're in – if something is scary, threatening, joyful, or otherwise emotionally relevant, then the subsequent change in emotional response that we experience also increases eccrine sweat gland activity. Research has shown how this is linked to emotional arousal (Boucsein, 2012; Salimpoor et al, 2009; Critchley, 2002).

It is noteworthy that both positive ("happy" or "joyful") and negative ("threatening" or "saddening") stimuli can result in an increase in arousal – and in an increase in skin conductance. The GSR signal is therefore not representative of the type of emotion, but the intensity of it."

GSR Sensors

"As GSR measurements work by detecting the changes in electrical (ionic) activity resulting from changes in sweat gland activity, the electrodes must be sensitive to these changes, and able to transmit that information to the recording device.

Most modern GSR electrodes have an Ag/AgCl (silver-chloride) contact point with the skin. Ag/AgCl electrodes are used as they are cheap, robust, safe for human contact, and of course are able to accurately transmit the signal from the ionic activity.

Some electrodes also come prepackaged with ionic gel that can increase the signal fidelity, or ionic gel can be applied to achieve the same effect. Either way, the signal is sent through the electrode, to the wire (usually lead) that passes the information to the GSR device.

From here the data is either stored within the device to be later uploaded, is transmitted wirelessly to a computer system, or the signal is sent through a further wired connection to a computer. Different GSR sensors allow different means of transmission, and the choice of each will depend on the kind of research you're carrying out."

Source: Farnsworth, B., 2018, What is GSR (galvanic skin response) and how does it work?, available at https://imotions.com/blog/gsr/

Boucsein, W. (2012). Electrodermal Activity. New York, Berlin: Springer, 2nd edition

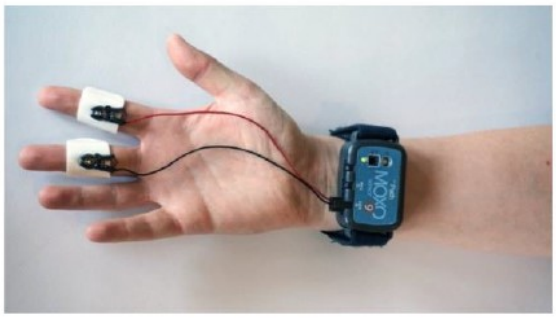
Salimpoor, V.N., Benovoy, M., Longo, G., Cooperstock, J.R. & Zatorre, R.J. (2009). The rewarding aspects of music listening are related to degree of emotional arousal. PLoS ONE 4, e7487

Critchley, H. D. (2002). Electrodermal responses: What happens in the brain. Neuroscientist, 8, 132-142

Examples of wearable mood trackers based on skin conductivity

Empatica Embrace

Moxo



Feel wristband

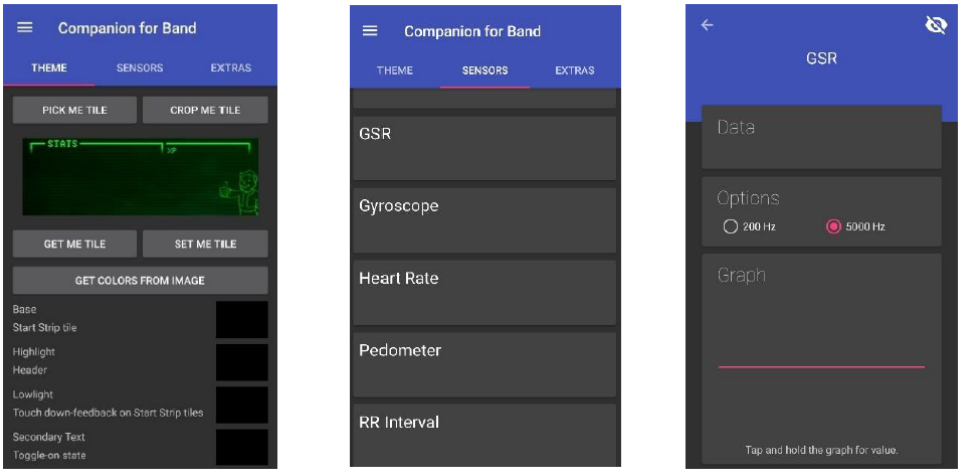
Source: https://www.wareable.com/wearable-tech/wearables-that-track-emotion-7278

Microsoft Band 2

The Microsoft Band 2 fitness tracker, has been chosen for its rich sensor set and accessibility of data. It is one of the few consumer wearables incorporating a skin conductance and skin temperature sensors.[9] This wearable provide programming interfaces for the Android environment which was used for the data collection, aggregation and synchronization to provide the necessary results for the study purpose.

Source: https://support.microsoft.com/en-us/topic/what-can-i-still-do-with-my-microsoft-band-a2a59355-5be0-3441-9fff-4dc27bcbafb5

2 points the GSR sensor



[9] Hänsel, K., Poguntke, R., Haddadi, H., Alomainy, A.,Schmidt, A., 2018, 'What to Put on the User: Sensing Technologies for Studies and Physiology Aware Systems', conference CHI 2018, April 21–26, 1-14

3. Participants

Participant	Gender	Nationality	Age	Education	Area
P1 (also *Int.P1*)	Female	Greek	29	Master's Degree	Nottingham
P2 (also *Int.P3*)	Female	Greek	32	Master's Degree	Nottingham
P3	Male	British	65	College Degree	Salford
P4	Female	Greek	26	Master's Degree	Bury St Edmunds
P5 (also *Int.P5*)	Male	Greek	36	PhD degree	Nottingham
P6	Male	British	18	High School Diploma	Salford
P7	Female	Korean	26	Master's Degree	MediaCity UK
P8	Female	British	67	Bachelor's Degree	Trafford
P9 (also *Int.P4*)	Male	Latvian	32	Bachelor's Degree	MediaCity UK
P10	Male	Greek	46	Master's Degree	Nottingham
P11 (also *Int.P6*)	Male	Greek	42	PhD degree	Nottingham
P12	Female	British	59	Bachelor's Degree	Salford
P13 (also *Int.P2*)	Female	British	28	Bachelor's Degree	MediaCity UK
P14	Male	Indian	35	High School Diploma	Eccles
P15	Female	Indian	30	High School Diploma	Eccles
P16	Female	British	23	Bachelor's Degree	Manchester city centre
P17	Female	British	24	Bachelor's Degree	Manchester city centre
P18	Male	Greek	26	Master's Degree	Nottingham
P19	Female	Spanish	32	Master's Degree	MediaCity UK
P20	Male	Spanish	34	Master's Degree	MediaCity UK

4. Psychometric test

The twenty field experiment participants completed this survey consisting of psychometric tests that had to be completed at each of the four public spaces as well as at the start of the trip in order for the researcher to be able to identify the mood variations during the period of the engagement with the media installations.

The University of Nottingham

This survey is part of a study for the University of Nottingham exploring the relationship between digital installations and human experience in public space. The information we collect will be used for the main case study data analysis for the PhD project: Redefining urban profiles- Transformations in urban space and public realm in the digital era.

Thank you for your willingness to participate!

All your answers are anonymous and your identity will be kept secret, the data being used solely for the present study.

Redefining Urban Profiles Survey 1

Name:_____

Participant ID No: _____

Part 1: YOURSELF (Please tick the response where indicated)

1.Age

- ☐ 16-24
- ☐ 25-44
- ☐ 45-64
- ☐ 65+

2. Gender

- ☐ Male
- ☐ Female
- ☐ Choose not to identify

3. Education

- ☐ Less than High School Diploma
- ☐ High School Diploma
- ☐ College Degree
- ☐ Bachelor's Degree
- ☐ Master's Degree
- ☐ Doctorate

Part 2: The next series of questions ask you about your mood right now. The best approach is to answer each question fairly and quickly. Please tick the response that most accurately captures your feelings right now.

	Definitely	Slightly	Not much	Definitely not
Active				
Contented				
Edgy				
Energetic				
Happy				
Nervous				
Calm				
Sluggish				
Sad				
Relaxed				
Sorry/ Regretful				
Passive				

Redefining Urban Profiles Survey 2

Participant ID No: _____

1. The next series of questions ask you about your mood right now. The best approach is to **answer each question fairly and quickly**. Please tick the response that most accurately captures your **feelings right now.**

	Definitely	**Slightly**	**Not much**	**Definitely not**
Active				
Contented				
Edgy				
Energetic				
Happy				
Nervous				
Calm				
Sluggish				
Sad				
Relaxed				
Sorry/ Regretful				
Passive				

2. Please answer the following questions about your **feelings and experience** in this place. It's best not to think too carefully about the answer, and **just give your immediate response**.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I feel *welcomed* in this place	5	4	3	2	1
I feel *safe* in this place	5	4	3	2	1
I find this place *attractive and pleasant*	5	4	3	2	1
I find this place *easy to socialize* and *meet people*	5	4	3	2	1
There is *much to explore and discover* in this place	5	4	3	2	1
I found the installations *easy* to play with	5	4	3	2	1

Redefining Urban Profiles Survey 3

Participant ID No: _____

3. The next series of questions ask you about your mood right now. The best approach is to **answer each question fairly and quickly**. Please tick the response that most accurately captures your **feelings right now.**

	Definitely	**Slightly**	**Not much**	**Definitely not**
Active				
Contented				
Edgy				
Energetic				
Happy				
Nervous				
Calm				
Sluggish				
Sad				
Relaxed				
Sorry/ Regretful				
Passive				

4. Please answer the following questions about your **feelings and experience** in this place. It's best not to think too carefully about the answer, and **just give your immediate response**.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I feel *welcomed* in this place	5	4	3	2	1
I feel *safe* in this place	5	4	3	2	1
I find this place *attractive and pleasant*	5	4	3	2	1
I find this place *easy to socialize* and *meet people*	5	4	3	2	1
There is *much to explore and discover* in this place	5	4	3	2	1
I found the installations *easy* to play with	5	4	3	2	1

Redefining Urban Profiles Survey 4

Participant ID No: _____

1. The next series of questions ask you about your mood right now. The best approach is to **answer each question fairly and quickly**. Please tick the response that most accurately captures your **feelings right now.**

	Definitely	**Slightly**	**Not much**	**Definitely not**
Active				
Contented				
Edgy				
Energetic				
Happy				
Nervous				
Calm				
Sluggish				
Sad				
Relaxed				
Sorry/ Regretful				
Passive				

2. Please answer the following questions about your **feelings and experience** in this place. It's best not to think too carefully about the answer, and **just give your immediate response**.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I feel *welcomed* in this place	5	4	3	2	1
I feel *safe* in this place	5	4	3	2	1
I find this place *attractive and pleasant*	5	4	3	2	1
I find this place *easy to socialize* and *meet people*	5	4	3	2	1
There is *much to explore and discover* in this place	5	4	3	2	1
I found the installations *easy* to play with	5	4	3	2	1

Redefining Urban Profiles Survey 5

Participant ID No: _____

1. The next series of questions ask you about your mood right now. The best approach is to **answer each question fairly and quickly**. Please tick the response that most accurately captures your **feelings right now.**

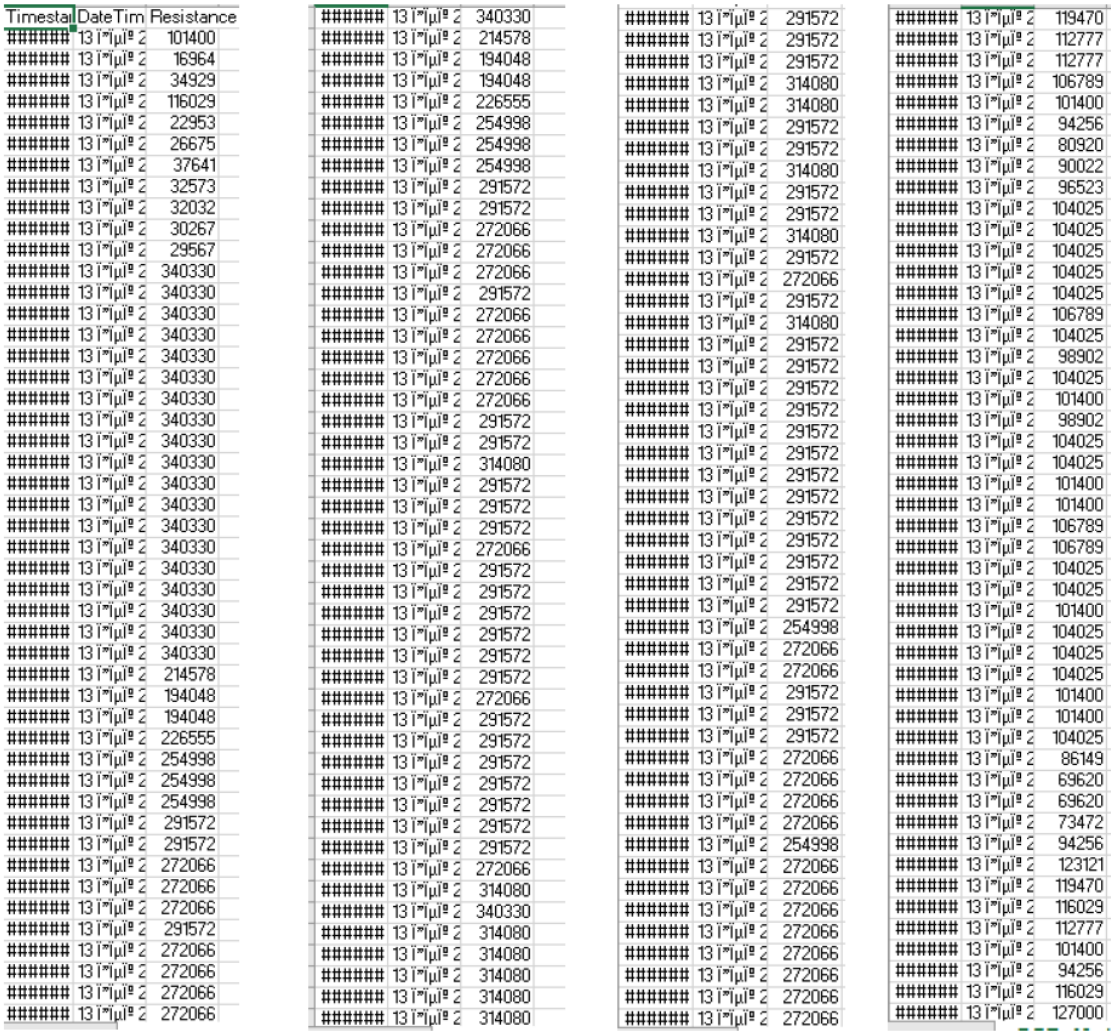
	Definitely	**Slightly**	**Not much**	**Definitely not**
Active				
Contented				
Edgy				
Energetic				
Happy				
Nervous				
Calm				
Sluggish				
Sad				
Relaxed				
Sorry/ Regretful				
Passive				

2. Please answer the following questions about your **feelings and experience** in this place. It's best not to think too carefully about the answer, and **just give your immediate response**.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I feel *welcomed* in this place	5	4	3	2	1
I feel *safe* in this place	5	4	3	2	1
I find this place *attractive and pleasant*	5	4	3	2	1
I find this place *easy to socialize* and *meet people*	5	4	3	2	1
There is *much to explore and discover* in this place	5	4	3	2	1
I found the installations *easy* to play with	5	4	3	2	1

5. Sample of raw GSR data

Ten out of twenty field experiment participants provided also GSR data by wearing the Microsoft wristbands.



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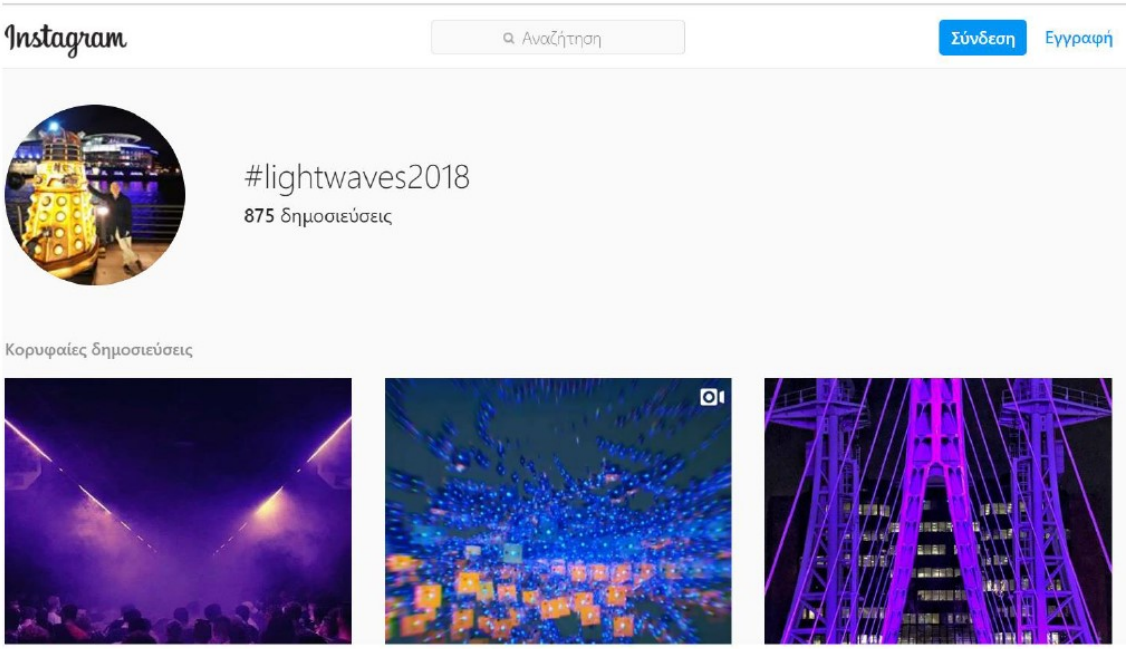
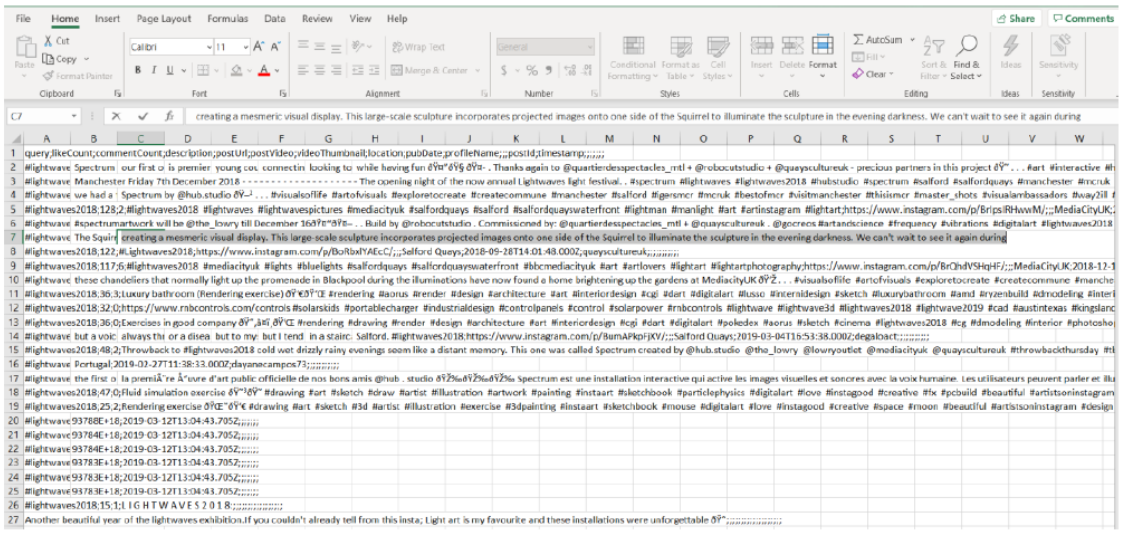
Appendix G

Instagram Data



Assessment of 875 images (203 miscellaneous)

Sample of raw data extracted from Instagram API



Appendix H

Ethical considerations and review process

Prior to the conduction of data collection, ethical approval was requested and obtained from Research Ethics Committee of The University of Nottingham.

Part of Ethical Approval form

Faculty of Engineering
Process for approval of research study involving human participants

Introduction
This document describes the process to be followed when planning and obtaining approval for studies involving human participants within the Faculty of Engineering. This process is based on one previously run within the School/Dept. M3. The process is administered by the Faculty Research Ethics Committee, and managed by the Chair of the Ethics Committee and the Faculty Research Ethics Officer. All queries regarding the process should be initially sent to ez-eng-ethics@nottingham.ac.uk

What is Ethics Approval?
When conducting any study or observation or collecting data about individuals, it is essential that full consideration is given to ethical issues and that steps are taken to ensure participant well-being throughout the study.
Participants involved in research studies have a right to:
- Know the goals of the study and who is funding the work
- Make an informed decision about whether or not they wish to participate
- Leave the study at any time if they do not wish to continue
- Know what will happen to them during the study and how long it will take
- Know if they may experience any discomfort
- Know what will happen to the findings
- Privacy of personal information
- Be treated courteously

The University of Nottingham and Faculty of Engineering have an ethics procedure that requires all staff and students to submit an application for ethical approval before conducting any research study involving human participants. Members of the Ethics Committee read through study proposals to check that the researcher has demonstrated that they have given full consideration to ethical issues and that they have provided participants with appropriate and sufficient information.

Who needs Ethics Approval?
ANY member of staff or registered student of the University of Nottingham involved in conducting any study or observation or collecting data about individuals **MUST** adhere to the University Code of Research Conduct and Research Ethics. Those affiliated with the Faculty of Engineering **MUST ALSO** comply with the Faculty ethical approval process before commencing their study.

Ethics application procedure

The attached document outlines the ethics approval process within the Faculty of Engineering. For all applications required to undergo formal review, applications must be submitted to the **Ethics Administrator**, APM Hub, L4-B03, Faculty of Engineering. The application will then be reviewed by the ethics committee. We aim to return a decision to applicants within two weeks but the procedure may be delayed if the ethics committee require further information. It is the applicant's responsibility to make sure that applications are submitted in good time.

Ethical Issues Checklist

The purpose of this Checklist is to facilitate the review process and to identify any ethical issues that may concern the Committee. It is meant to be an aid to both the researcher and the Committee. Listed below are areas which require some justification and attention on your part in specifying your study protocol. Please answer each question honestly, giving full details where required. Answering "YES" to any of the questions will not necessarily lead to a negative response to your application but it will draw issues to your attention and give the reviewers the opportunity to ensure appropriate steps are being taken. In expedited review, supervisors should ensure that for any questions where the answer "YES" has been given, appropriate measures have been taken to maintain ethical compliance.

Applicant's full name **Evangelia Pavlaki**

You must complete ALL of this section before submitting your application

1 Who is the population to be studied?

Visitors of MediaCity's LightWaves event; Curators, project managers, artists and staff involved in the organization of the event; Volunteers; Individuals working in the area regardless their relationship with the event (Office employees, shop owners, etc.)

2 Please give details of how the participants will be identified, approached and recruited. (Include any relationship between the investigator and participants e.g. instructor-student).

During the research 20-25 semi-structured interviews and experience journeys will be conducted. The participants will be all aged 18 and above and will be selected according to various age and user groups (students, office employees, local residents, etc.). Participants will be identified and approached on site. The duration of the interviews is estimated around 10-15 minutes and participants will be recruited in different locations of the event area. Duration of the experience journeys is based on the participant's preference.

1. Before the interview, interviewees will be given the information sheet including the interview questions, and consent form.
2. The interviews will be conducted once the potential interviewees have approved and signed the consent form.
3. The interviews will be conducted in person.

3 Will the population studied include any vulnerable members of the public? **YES** **NO**
Note: for the purpose of ethics approval this includes participants who are under 18, people who are disabled or in poor health, and also those who are non-English speakers and may not be able to understand the consent forms. (If YES, please give further details)

4 Will it be possible to associate specific information in your records with specific participants on the basis of name, position or other identifying information contained in your records? **YES** **NO**

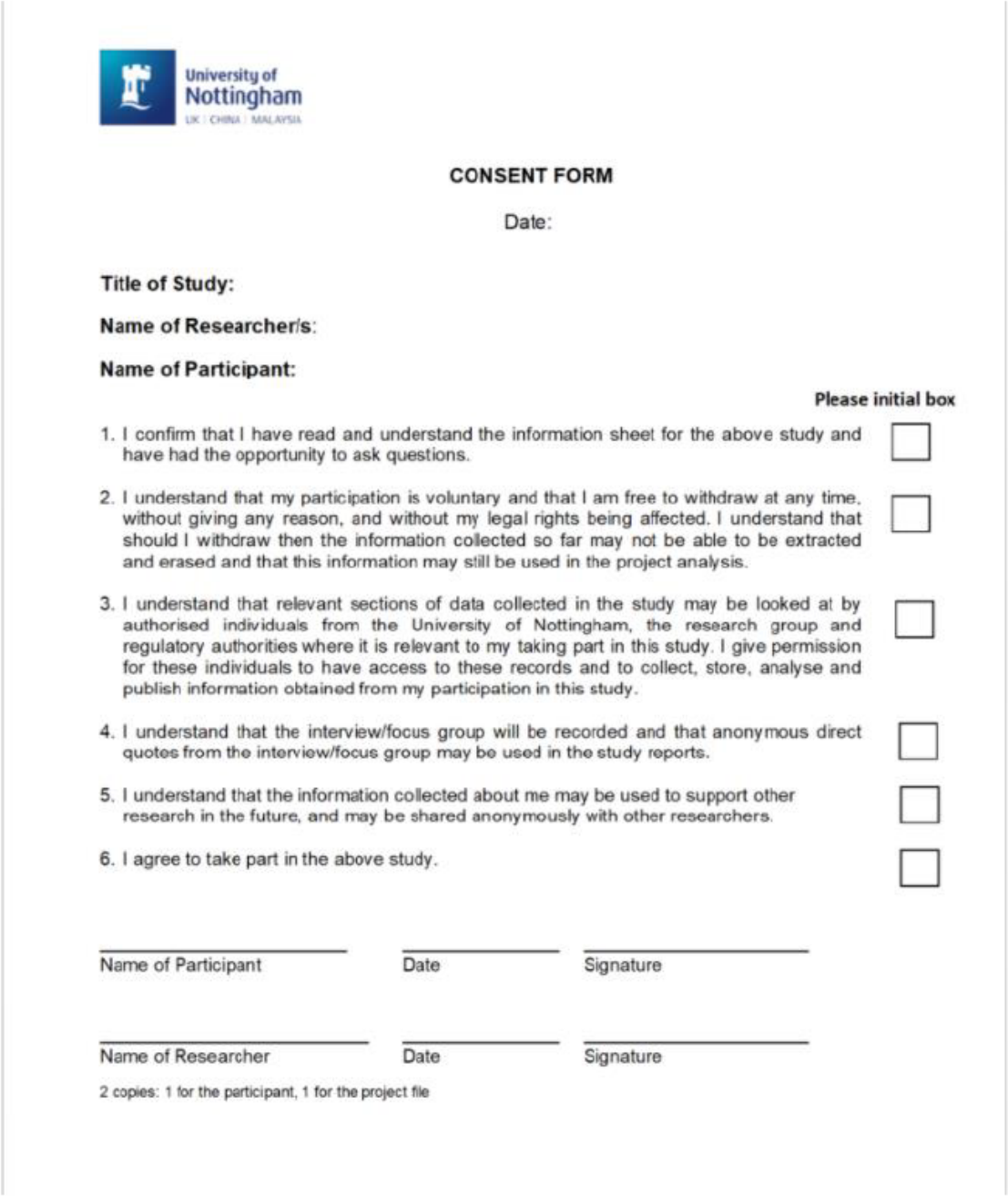
5 What steps have you taken to ensure confidentiality of personal information and anonymity of data both during the study and in the release of its findings?

Information will not be accessed or used by anyone else apart from the researcher and supervisor. The interviewees will be given the options in the consent form if they want their personal information to be identified or not.

6 Describe what data will be stored, where, for what period of time, the measures that will be put in place to ensure security of the data, who will have access to the data, and the method and timing of disposal of the data.

Consent forms and data collection tools and procedures were submitted as part of the review process. Part of these documents can be found below:

Participant consent form



University of Nottingham
UK | CHINA | MALAYSIA

CONSENT FORM

Date:

Title of Study:

Name of Researcher/s:

Name of Participant:

Please initial box

1. I confirm that I have read and understand the information sheet for the above study and have had the opportunity to ask questions. ☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, and without my legal rights being affected. I understand that should I withdraw then the information collected so far may not be able to be extracted and erased and that this information may still be used in the project analysis. ☐
3. I understand that relevant sections of data collected in the study may be looked at by authorised individuals from the University of Nottingham, the research group and regulatory authorities where it is relevant to my taking part in this study. I give permission for these individuals to have access to these records and to collect, store, analyse and publish information obtained from my participation in this study. ☐
4. I understand that the interview/focus group will be recorded and that anonymous direct quotes from the interview/focus group may be used in the study reports. ☐
5. I understand that the information collected about me may be used to support other research in the future, and may be shared anonymously with other researchers. ☐
6. I agree to take part in the above study. ☐

Name of Participant	Date	Signature
Name of Researcher	Date	Signature

2 copies: 1 for the participant, 1 for the project file

Part of Participant Information Sheet

University of Nottingham
UK | CHINA | MALAYSIA

Participant Information Sheet

Date:

Title of Study:

Name of Researcher(s): Evangelia Pavlaki

We would like to invite you to take part in our research study. Before you decide we would like you to understand why the research is being done and what it would involve for you. One of our team will go through the information sheet with you and answer any questions you have. Talk to others about the study if you wish. Ask us if there is anything that is not clear.

What is the purpose of the study?

The purpose of this research is to explore the impact of digital technology's application on public space and urban experience. More specifically, this study aims to assess the effects of interactive installations deployed during the Lightwaves event, in Manchester's MediaCity, on users' social and personal experience.

Why have I been invited?

You are being invited to take part because you are over 18 and present in the public space of MediaCity during the period of LightWaves event either as a visitor or working. We are inviting 15-20 participants like you to take part.

Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form (completion and return of a Questionnaire can be taken as implied consent). If you decide to take part you are still free to withdraw at any time and without giving a reason. This would not affect your legal rights.

What will happen to me if I take part?

Semi- structured recorded interviews are going to be conducted in this part of the study. Planned duration of the interviews is 10-15 minutes and participants are going to be asked questions about their personal experience in the public space of MediaCity during the Lightwaves event, any challenges that they have possibly faced, their favourite activities and potential implications/ ideas on future design and strategy decisions about temporary or permanent digital interventions in the urban context. Particularly, the study requires participants' descriptive perspective on the phenomenon of temporary transformation of the city through digital interventions, by sharing their experiences, views and ideas.

Interviews with visitors will mainly focus on their personal experiences, feelings and activities while using the space, while interviews with people working in the area will focus on their broader impression regarding the collective behaviour and community engagement they noticed as observers of the area. Key concepts of the interview are description, spontaneity and natural attitude and language.

Audio records of the interviews will be used for further data analysis.

Data Collection Sheet for semi-structured interviews with users

Department of Architecture and Built Environment

PhD Case Study

Student: Evangelia Pavlaki, 4311484

Data Collection Sheet

This fieldwork takes place in the area of the digital event LightWaves 2018 in MediaCity, Salford Quays, Manchester. Data collection will be held in several locations during different times of the day and semi-structured interviews will be conducted with people from different age groups who are either visiting the area (mostly local residents, as they will have a wider perception of area's character) or working there.

Location:

Date: Time:

Participant's details (Gender, Age, Region):

The participants may not give their personal details at their absolute discretion

Data collected from these semi-structured interviews will focus on information regarding emotional reaction and impressions after the use of the digital installations, potential differences in the population of the area during the event, resident's routine trips and destinations, visitors' engagement with the installations and shared encounters formed between them, types of activities preferred or required. Finally, views and perspectives on installations' usability and clarity will be considered as well as interviewees' general suggestions and ideas.

Semi- structured Interview with Users[1]

Purpose of visit general information and

1) Why did you come here today?

2) Did you know about the event taking place here?

If yes,

- How?

3) Have you been here before?

If yes,

- What is your general perception of this area? (Short description. Vibrant area, quiet place, crowded, not crowded, popular during events, inviting/ not so inviting, focal area for passers-by, neutral, what would you change?, etc.)
- Did you spent the same amount of time here today in comparison to other times?
  If no,
  -Was it less or more and why?

Lived Experience

4) How would you describe your general experience today?

5) Did you notice any changes in your mood during or after of your visit? (Uplifted, frustrated, tired, happy, etc.)

If yes,

- Could you describe them?

Social experience, Shared encounters and activities

6) Did you feel any sense of connection to other people while being here today? (More open to approach or being approached, co-operate during engagement with installation, talk, meet)

If yes,

- Who were them?

For those who came with company

7) Would you feel comfortable visiting the place and playing with the installations alone?

For people who are familiar with the area

8) Do you feel safe normally during the night?

If no,

- Are there any changes in that feeling now?

Engagement with installations

9) Have you interacted with similar digital installations before?

10) Did you feel motivated to interact with the installation(s) today and why?

If Yes

- How did you learn how the installation works? (Experimentally, asking, observing others, etc.)
- Did you enjoy the interaction? What was your main impression?

Views on digital interventions

11) Would you like to experience interactive happenings like this more frequently in the city and why?

Others

12) What is your overall impression after your visit today?

13) Is there anything else you would like to add that would help me to better understand your experience of the place and what it meant to you?

Data Collection Sheets for field Observations

The University of Nottingham
Faculty of Engineering
Department of Architecture and Built Environment
PhD Case Study
Student: Evangelia Pavlaki, 4311484

Data Collection Sheet

Fieldwork Diary

Date and Time:

Location:

Observations on Thresholds of interaction

Name of installation	Type of Interaction in zone 1 (high proximity)	Type of Interaction in zone 2 (medium proximity)	Type of Interaction in zone 3 (low proximity)

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Faculty of Engineering
Department of Architecture and Built Environment

PhD Case Study

Student: Evangelia Pavlaki, 4311484

Data Collection Sheet

Fieldwork Map

Date:

Location:

Observations on Space Choreography

This study will focus on pedestrian flows and movement on different times of the day during weekdays and weekends. Routine trips and destinations will be indicated on the map. Data collected from this process may be accompanied by photographic and video material for further analysis and illustration purposes which will protect the identity of people captured *(blurred faces)*.

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Student: Evangelia Pavlaki, 4311484

Data Collection Sheet

Fieldwork Diary

Date: Weather Conditions:

Location:

Observations on place's population and activities

Time	Number of People (headcount)	Main activities	Average length of stay	Description (transitional zone, quick stopping area, relaxation area)
09.00				
10.00				
11.00				
12.00				
13.00				
14.00				
15.00				
16.00				
17.00				
18.00				
19.00				
20.00				

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Department of Architecture and Built Environment
PhD Case Study
Student: Evangelia Pavlaki, 4311484

Data Collection Sheet

Fieldwork Diary

Date:

Location:

Observations on Users' engagement with installation and social encounters

Time	**Description of Bodily Engagement** (Average length of engagement with installation, types of moves, individual or co-operative action)	**Description of shared encounters and activities** according to proximity to the installation	**Encounters with strangers** (co-operating or socializing with strangers while using the installation and spatial relations with them)

Data collected from this process will be accompanied by photographic and video material for further analysis and illustration purposes which will protect the identity of people capture (blurred faces)

Data Collection Sheets for field Experiment

The University of Nottingham

Faculty of Engineering

Department of Architecture and Built Environment

PhD Case Study

Student: Evangelia Pavlaki, 4311484

Data Collection Sheet

Experience Journey

Participants details (Gender, Age, Region, Purpose of visit):

The participants may not give their personal details at their absolute discretion

Date:

Starting Location: Time:

Ending Location: Time:

Mapping and recording participant's experience and perception while walking in the study are

Total duration of walk:

Data collected from this process will be accompanied by photographic and video material for further analysis and illustration purposes which will protect the identity of people captured (blurred faces).